

Everyman's Encyclopædia

IN TWELVE VOLUMES

VOLUME SIX

Foote
TO
Hasdrubal

THE THIRD EDITION

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EVERYMAN'S ENCYCLOPÆDIA
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FOOTE — HASDRUBAL**

EDITED BY ATHELSTAN RIDGWAY, LL.B.



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**EVERYMAN'S
ENCYCLOPÆDIA**

IN TWELVE VOLUMES

VOLUME SIX **RETROCONVERTED**
B. C. S. C. L.



LONDON: J. M. DENT & SONS LTD.
TORONTO: J. M. DENT & SONS (CANADA) LTD

J. M. DENT & SONS LTD.
Aldine House · Bedford St. · London
or
J. M. DENT & SONS (CANADA) LTD.
224 Bloor St. West · Toronto 5

*Made in Great Britain by
The Temple Press · Letchworth · Herts
and Richard Clay & Co. Ltd.
Bungay · Suffolk*

ABBREVIATIONS

The titles of subjects, which are printed first in bold type, have been abbreviated within each article to the initial letter or letters.

ac., acre(s).	is., island(s).
agric., agricultural.	It., Italian.
ambas., ambassador(~).	Jap., Japanese.
Amer., American.	jour., journal.
anc., ancient.	Lat., Latin.
ann., annual.	lat., latitude.
arron., arrondissement.	lb., pound(s).
A.-S. , Anglo-Saxon.	l. b., left bank.
A.V. , Authorised Version.	long., longitude.
b., born.	m., mile(s).
Biog. Dic. , Biographical Dictionary.	manuf., manufacture.
bor., borough.	min., minute(s).
bp., birthplace.	mrkt. tn., market town
Bri' British.	MS., manuscript.
c., Cen. ig. ade.	mt., mount; mountain.
c., about.	N., north; northern.
cap., capital.	N.T., New Testament.
cf., comparo.	O.E., Old English.
co., county.	O.F., Old French.
com., commune.	O.T., Old Testament.
cub. ft., cubic feet.	oz., ounce(s).
d., died.	par., parish.
Dan., Danish.	parl., parliamentary.
dept., department.	pop., population.
dist., district.	prin., principal.
div., division.	prof., professor.
E., east; eastern.	prov., province, provincial.
eccles., ecclesiastical.	pub., published, publication.
ed., edition; edited	q.r., which see.
e.g., for example.	R., riv., river.
Ency. Brit. , Encyclopaedia Britannica.	r. b., right bank.
Eng., English.	Rom., Roman.
estab., established; establish-	R.V., Revised Version.
ment.	S., south; southern.
F., Fahrenheit.	sec., second(s).
fl., flourished.	sev., several.
fort. tn., fortified town.	Sp., Spanish.
Fr., French.	sp. gr., specific gravity.
ft., feet.	sq. m., square mile(s).
Ger., German.	temp., temperature.
Gk., Greek.	ter., territory.
gov., government.	tn., town.
Heb., Hebrew.	trans., translated; translation.
hist., history.	trib., tributary.
horticult., horticultural.	univ., university.
h.p., horse-power.	urb., urban.
hr., hour.	vil., village.
i.e., that is.	vol., volume.
in., inch(es).	W., west; western.
inhab., inhabitant(s).	Wm., William.
	yd., yard.

The article ABBREVIATIONS contains a list of those in general use.
See also ABBREVIATION (music) and ELEMENTS (chemical symbols).

F

Foot, Samuel (1720-77), actor and dramatist. After squandering his patrimony, went on the stage, making his first appearance in a small part in *Othello* at the Haymarket in 1744. He at once achieved some success, and later became a fashionable actor, and was highly regarded by the public of his day. Occasionally he gave entertainments, in which he was able to exhibit his powers of mimicry, which were very considerable. He wrote many plays, some of which were once highly regarded. More than once the censor interfered with his productions, and he was forbidden to play his *Trip to Calais*, in which he lampooned the bigamous duchess of Kingston. A clever man and a brilliant conversationalist, he was much sought, but his selfishness and unscrupulousness left him almost friendless. There is a biography by Wm. Cooke, 1805. See also Boswell's *Life of Johnson*.

Foot Guards, select regiments, the 'flower of the Brit. infantry,' including Grenadier (three battalions), Coldstream (three battalions), and Scots Guards (two battalions), the Irish Guards (one battalion), and the Welch Guards (one battalion). They form the garrison of the metropolis. See HORSEHOLD TROOPS and under the names of the sev. regiments.

Foothills, see under MOUNTAINS.

Footpaths, and Preservation of, paths for the use of pedestrians (foot-passengers) only, as opposed to highways for vehicles or horses. The Commons, Open Spaces, and Footpaths Preservation Society (formed 1899 by amalgamation of the National Footpath Preservation Society with the Commons Preservation Society) aims at preserving footpaths, bridle-paths, and other rights of way. It serves to guard public rights to common land, roadside waste, vil. greens, and all open spaces of the kind. London offices are at 71 Eccleston Square, Westminster. Scotland has a similar Scottish Rights of Way and Recreation Society Ltd.

Plans for giving to the public new rights of access to mts., moors and other uncultivated land, and for creating new rights of way and defining and maintaining old ones, are outlined in the report of the Special Committee on Footpaths and Access to the Countryside (under the chairmanship of Sir Arthur Hobhouse), which was appointed by the National Parks Committee in July 1916 at the request of the minister of tn. and country planning. The report (pub. as Cmd. 7207 in 1917) strongly recommends (*inter alia*) such schemes as the proposed Pennine Way, along which, according to a preliminary survey, 180 m. of footpath already exist, and the reopening of the old coastguards' path as a right of way for walkers round the whole coastline of England and Wales, except where building

makes this impossible and, in such cases as the latter, detours should be provided. Other long-distance F. recommended are Chilterns to the Devon coast (about 200 m., requiring about 60 m. of new F. from the Gog Magog Hills, near Cambridge, to Seaton Bay); the Pilgrims' Way (Canterbury to Winchester, about 120 m., requiring about 50 m. of new F.); the S. Downs to Salisbury Plain (from Beachy Head to Winchester, about 70 m., requiring about 25 m. of new F.); Offa's Dyke (Prestatyn to the Wye near Chepstow, roughly 150 m., requiring perhaps 50 m. of new F.); The Thames (Teddington to Cricklade via the tow-paths, about 136 m.). The report recognises a national element in the demand for long-distance routes, and recommended that the National Parks Commission (see NATIONAL PARKS) should be empowered to make grants to local planning authorities for the creation or improvement of long-distance and coastal F. See Sir L. Chubb and R. Glen, *Maintenance of Public Footpaths*, 1932.

Foot-pound, in mechanics, the unit by which work is measured; the amount of energy to raise a weight of 1 lb. through a distance of 1 ft.

Footscray, busy manufacturing suburb of Melbourne, which lies 4 m. to the E. in Victoria, Australia. It is in Bourke co., and on the Saltwater R., and is noted for its bluestone quarries. Pop. 20,000.

Footwear, see BOOTS AND SHOES.

F.O.R. Abbreviation for 'free on rail,' denoting in contracts for the sale of goods that the cost of carriage and handling the goods and putting them on the railway, but not the cost of the railway freight, must be paid by the seller.

Forage Crops, see FATTENING FOODS.

Foraminifera (bearing 'foramina' 'pores'), in zoology the name first given by D'Orbigny (1826) to a group of minute animals, a shell or 'test' usually perforated by tiny holes being characteristic of most of the species. Since Dujardin's researches (1835) they have been considered as a sub-division of Protozoa, and are ranked as an order of Rhizopoda, distinguished by pseudopodia given off from the sarcodite (protoplasm) and beautiful calcareous shells. The shells may be chitinous or arenaceous also (covered with sand, mud, etc.), and these are rarely perforated. There are usually one or more general apertures, through which the animal within can come into contact with the water. They are mostly marine animals, but some kinds (with chitinous shells) are found in fresh water. The shells may be formed by a single chamber or by sev. (polythalamous). Comparatively little is known of the animals themselves, but as limestone-builders their deposits remain in S. Europe, N. Africa, and Asia. Among

the chief families are the Gromidae, Miliolidae, Globigerinidae, and Nummulitidae. They appear to have been most abundant since the close of the Palaeozoic era. See F. Chapman, *The Foraminifera*, 1902, and Sir R. Lankester, *Treatise on Zoology*, 1903.

Forbach, tn. on a trib. of the Rossel, 33 m. E. by N. of Metz, in the dept. of Moselle, France. Garden tools and papier-mâché are manufactured, and there are coal-mines and iron works. Here the Fr. suffered a defeat during the Franco Prussian war (Aug. 6, 1870). Pop. 11,400; arron. 113,300.

Forbes, Archibald (1838–1900), Brit. war correspondent and journalist, b. in Morayshire. Served in the Royal Dragoons. But he soon abandoned the army for journalism, and joined the staff of the *Daily News* as war correspondent, accompanying the Ger. Army through the war of 1870–71. During the Afghanistan campaign of 1878–79 F. was under fire, and after that he visited Mandubey and Zululand, and his famous ride of 120 m. in 15 hrs. to convey the news of the victory of Ulundi to England ranks as one of the finest achievements in journalistic enterprise. He afterwards devoted himself mainly to lecturing at home and in America and Australia. His pubs. are *Souvenirs of Some Continents* (1885) and *Memoirs and Studies of War and Peace* (in many respects autobiographical) (1895).

Forbes, David (1826–76), Eng. geologist and brother of Edward F., b. at Douglas, Isle of Man. In England he was a pioneer in microscopic petrology, and was elected F.R.S. in 1858. Among his scientific papers are *The Relations of the Silurian and Metamorphic Rocks of the South of Norway* (1855); *Researches in British Mineralogy* (1867–68); and *The Causes producing Foliation in Rocks* (1855), etc.

Forbes, Duncan (1685–1747), Scottish statesman and jurist, b. near Inverness. In 1709 he was admitted advocate at the Scottish Bar. He took an active part in putting down the rebellion of 1715. In 1725 he became lord advocate, and in 1737 he was made lord president of the court of session. By his exertions in the Hanoverian interest the rebellion of 1715 was prevented from spreading more widely among the clans. F. was the author of *Some Thoughts concerning Religion, Natural and Revealed* (1735); *Reflections on Incredulity* (2nd ed., 1750); and an autobiography (1748).

Forbes, Edward (1815–51), Eng. naturalist, b. in the Isle of Man. In 1843 he became prof. of botany at King's College, London, and curator of the Geological Society; and ten years later he was elected to the chair of natural hist. in the univ. of Edinburgh. A new era in that branch of zoology was begun by his classification of the Brit. star-fishes. Upwards of 200 of his works and papers were pub., notably *Star-fishes* (1842); *Naked-eyed Medusæ* (1848); *British Mollusca* (1848), etc.; and with T. Spratt, *Travels in Lycia* (1847). See G. Wilson and A. Gekle, *Memoir of Edward Forbes*, 1861.

Forbes, James David (1809–68), Scottish

scientist, grandson of Sir W. F. (1739–1806). He was prof. of natural philosophy at Edinburgh Univ. (1833–60), and then became principal of St. Andrews United College. With Brewster he helped to found the Brit. Association (1831). His discoveries relative to the movement of glaciers and the polarisation of heat and light are famous. Among his pubs. are *Travels through the Alps of Savoy* (1843); *Norway and its Glaciers* (1853); *Tour of Mont Blanc and Monte Rosa* (1855); *Dissertation on the Progress of Mathematical and Physical Science* (1858); *Occasional Papers on the Theory of Glaciers* (1859); contributions to the *Edinburgh Philosophical Journal*, signed 'A'. See J. Tyndall, *Professor Forbes and his Biographers*, 1873.

Forbes, Joan Rosita (Mrs. A. T. McGrath) (b. 1893), Eng. traveller and writer, a daughter of H. J. Torr, of Morton Hall, Lincolnshire. She has travelled extensively in Africa, Arabia, and also visited the W. Indies. In 1920 she accompanied an expedition to the Kufra Oasis, Libya, and in the next four years visited Asir (then in the Yemen) and Abyssinia, through which latter she went with a cinema expedition. Received the gold medal of scv. geographical societies. Novels: *The Jewel in the Lotus* (1922); and *One Flesh* (1931). Books of travel and adventure: *The Secret of the Sahara-Kufara* (1922); *Forbidden Road—Kabul to Samarkand* (1937); *India of the Princes* (1939); *The Prodigious Caribbean* (1940); *Appointment with Destiny* and an *Autobiography* (1946). Married firstly Col. Ronald F., and secondly Col. A. T. McGrath.

Forbes, Staphope Alexander (1857–1947), Irish painter, b. in Dublin, Nov. 18; educated at Dulwich College, the Lambeth School of Art, and the Royal Academy school. He also studied in Paris, and became a pupil of Léon Bonnat, by whom and by Jules Bustien-Lepage his subsequent work was strongly influenced. His chief characteristic was faithfulness to the scene in pictures of everyday life, and this with its reaction from romanticism became the dominant feature of the Newlyn school of painters in Cornwall, of which he was the leading representative. He exhibited in the Royal Academy from 1892, when he was elected A.R.A., becoming R.A. in 1910. His first wife Elizabeth was also an artist of distinction, whose influence, like that of her husband, was exerted on the Cornish school of painters. Elizabeth F. d. in 1912. The fresco of the 'Fire of London,' which F. painted for the Royal Exchange was completed in 1899. Among his best pictures are 'The Fish Sale on the Cornish Beach,' 'By Order of the Court,' 'Forging the Anchor,' 'The Smithy,' and 'The New Calf.' In later life he turned his attention away from genre painting, and more to landscape.

Forbes-Robertson, Sir Johnston (1853–1937), famous Eng. actor, b. Jan. 16, in London; son of the art critic (d. 1903). Educated at Charterhouse, at Rouen, and at Royal Academy. He early won distinction as a painter, exhibiting at the

Royal Academy about 1870. He studied elocution under S. Phelps; making his first stage appearance in 1874, and soon becoming one of the foremost actors of his time, noted for his beautiful voice. He toured with Ellen Terry, and acted also with her sister Marion, making a hit in *Dr. and Mrs. Neill*, and as Geoffrey Wynniard in *Dan'l Druce* (1876). He acted with the Bancrofts, Hare, and Henry Irving, and under his own management with Mrs. Patrick Campbell, won success in *The Notorious Mrs. Ebbesmith* (1895), *Romeo and Juliet*, and other plays. He played with Mary Anderson in *The Winter's Tale* (1887), designing the dresses for this production. Among his noted Shakespearian roles were Hamlet, Othello, Shylock, Leontes, and Macbeth. As a romantic actor he triumphed in *For the Crown* (1896), *Mice and Men* (1902), *The Light that Failed* (1903), and *The Passing of the Third Floor Back* (1908). He married Gertrude Elliot in 1900, and appeared with her as his leading lady—frequently touring in America, where *Cæsar and Cleopatra* was first produced (1906). His farewell London season was held at Drury Lane (1913), with selections from his repertoire. He was knighted in 1913, and retired from stage 1915. He wrote *A Player under Three Reigns* (1925).

Forbes-Robertson, Lady, see ELLIOTT, MAY GERTRUDE.

Forbes, tn. on the r. b. of the Lachlan, 90 m. W. of Bathurst, in the co. of Ashburnham, New S. Wales. It has a meat-freezing works and a wool-scouring factory. Pop. 4300.

Forbidden Fruit, or Adam's Apple, so called from the fruit forbidden to Adam (Gen. ii. 17), is the name often applied to sev. species of *Citrus*, especially on the Continent to *C. decumana*, a Malayan or Chinese tree much cultivated in India and Florida. *C. medica* (var. *paradisi*) is also so called. In Great Britain pomeloes, a variety of shaddock, are known by this name. The fruit of *Tabernaemontana dichotoma* (Apocynaceæ) in Ceylon also bears the name, and is said to be poisonous since Eve ate of it.

Forbin, Claude, Comte de (1656–1733), one of the greatest Fr. naval commanders. He showed reckless courage at Messina (1675), the Antilles (1680), Algeria (1682–1683). He accompanied Chaumont to Siam (1685), becoming admiral to the king of Siam (1686–89). As chef d'escadre in the Sp. Succession war, he fought often against the Eng. and Dutch (1702–10). His *Mémoires* were ed. by Reboulet (1730). See life by A. Richer, 1784.

Force, in mechanics, that which changes or tends to change a body's state of rest, or of uniform motion in a straight line. This definition is derived from Newton's first law of motion, which states that every body continues in its state of rest, or of uniform motion in a straight line, except in so far as it may be compelled by impressed F. to change that state. We can only get an idea of F. by observing its effects, that is, F. can only be measured by measuring the change of motion produced by it. Thus, Newton's second law

states that change of motion is proportional to the impressed F., and takes place in the direction in which the F. acts. By motion Newton meant momentum, which is a function of the mass of a body as well as of its velocity. This agrees with our experience, because the idea of force is derived from muscular effort, and we know that we have to exert more strength to stop the motion of a heavy body than of a light one, just as we have to exert more strength to stop the motion of a rapidly moving body than of a slowly moving one. F., then, is measured by change of momentum, momentum being equal to mass \times velocity. But it is obvious that the longer the F. acts the greater is its effect in changing the momentum. Therefore, we have F. proportional to change of momentum and inversely proportional to the time. The unit of F. may now be expressed as that F. which produces on a unit of mass a unit change of velocity, or, more concisely, force = mass \times acceleration. Given the foot as unit of length, pound as unit of mass, and second as unit of time, we have as the derived unit of F. that F. which, acting on a mass of 1 lb. for 1 sec., produces an additional velocity of 1 ft. per sec.; this unit is called the poundal. In the C.G.S. system of units, the unit of F. is the dyne, which is that F. which produces in a mass of 1 gramme an acceleration of 1 centimetre per sec. per sec. See F. Burraclough and E. J. Holmyard, *Mechanics for Beginners*, 1931, 1947.

Facciolini, Egidio (1688–1768), It. lexicographer, was the pupil of Jacopo Faccioliati, a prof. at Padua. It was F. who assisted the latter in his great work, the compilation of a lexicon, and he, in his turn, brought out a new Lat. dictionary, pub. after his death in 1771. The latest ed. pub. is that of 1858 to 1837. See FACCIOLIATI, JACOPO.

Forcesps, two-bladed metal instrument of the nature of pliers or pincers, used for seizing and holding objects firmly, especially in surgical and obstetric operations, and by dentists and watchmakers. There are many varieties, such as the dissecting F. with roughened points, the lithotomy F., the artery F., Liston's cutting F., and the fenestrated F. with apertures in the blade. The midwifery F., invented by P. Chamberlen in the seventeenth century, came into general use in the eighteenth century. Chemists and mineralogists use a small F. for adjusting weights and working with the blowpipe. In entomology, the word is applied to an organ or part of the body resembling a F., or to one of its two branches. Examples are the horny appendages at the extremity of the abdomen, found in many male insects, such as the earwig's caudal appendage.

Forces, Parallelogram of. Forces may be represented graphically by straight lines proportional to their magnitudes. If two forces are represented in magnitude and direction by two sides of a parallelogram drawn from a point, then their resultant is represented in magnitude and direction by that diagonal of the parallelogram which passes through the point.

Forchheim, tn of Upper Franconia, Bavaria, Germany, on the Regnitz, 16 m S E. of Bamberg, important in the early Middle Ages. From 1062 to 1802 it belonged to the bishopric of Bamberg. It is noted for textiles and a dye industry. Pop 10,300.

Forcible Entry, see ENTRY

Forcible Feeding, see under FOOD AND FEEDING

Forcing, acceleration of maturity in flower, vegetable, or fruit according as blooms, fruit, or foliage are desired. Artificial warmth is essential for it, and while in some cases a hotbed provides sufficient temp in other cases elaborately equipped F houses are needed. Among flowering plants hardy shrubs are most easily forced into early bloom, but they must be thoroughly matured and well provided with flower buds or foliage instead of blooms will be produced. A large variety of bulbs and bulbous rooted plants are well suited for it, and lilies of the valley are brought into bloom throughout the whole year. Most kinds of fruit can be produced by it. Strawberries are grown in pots standing on ash beds and in a temp of 75° fruit can be ripened by Christmas. Forced tomatoes need a similar temp but they meet with a very severe competition from importations from warmer countries and scarcely pay to grow. Grapes can be ripened at almost any time from the early spring by starting the shoots in a temp of about 40° and gradually increasing it until after the flowering period when from 60 to 70° is needed. Peaches, nectarines, and figs are forced in pots, starting with a temp of 45° and increasing to 60°. Hardier fruits are forced in cold or orchard houses. Asparagus, potatoes, lettuce, endive and other salad plants, seakale, chicory, and rhubarb are all easily forced on hotbeds; the three last need to be kept in the dark but the others need abundance of light. Remarkable experiments have recently shown that the natural resting period of plants can be intensified by exposing them with their roots in an air tight box to chloroform or ether. This is followed by much increased activity, and lilac and azalea blooms have been produced in about a fortnight. Lilies of the valley were forced into flower in only ten days. If some of the harder flowering plants is simplified by retarding the growth for a time in a refrigerating chamber. Following such treatment lilac, lilies, spiraea and *Azalea mollis* will come quickly into flower in an ordinary cool green-house.

Ford, Edward Onslow (1852 1901) Eng sculptor, studied painting in Antwerp and Munich (1870-72), and then took up sculpture. His most famous works are statues of Sir Rowland Hill (1882 Royal Exchange), W. L. Gladstone (1883), Irving as 'Hamlet' (1883), Gen Gordon (Chatham, 1890), Shelley memorial at Univ College, Oxford, Marlowe memorial at Canterbury, Huxley (1900), Brit Museum of Natural Hist.), busts of Millais, Briton Rivière and others statuettes of 'Folly,' 'Music,' 'Dancing,' (Tate Gallery), a relief, 'In Memoriam'

(1885). See M. H. Spickmann, *British Sculpture and Sculptors of To day, 1901*

Ford, Henry (1863 1947) Amer industrialist and one of the greatest manufacturers of motor cars in the world, was born at Greenfield near Dearborn Michigan U.S.A., son of Wm. Ford farmer of Irish stock. His mother was of mixed Dutch and Scandinavian origin. He was educated at the dist school where he seemed good but not brilliant at his studies. In 1880 he obtained a situation at \$2.50 a week in a machine shop in Detroit, and night work at mending watches—a thing he had taught himself at home. On his father's farm he experimented in the



HENRY FORD

manufacture of a steam tractor. In 1884 his father presented him with 40 acres of timbered land, on which he erected and worked a saw mill to dispose of the wood. In 1887 he became mechanist in the employ of the Edison company in Detroit which thereafter was the centre of his activities. In 1892 he produced his first motor car—a two cylinder 4 h.p. In 1899 he left the Edison company and went into the motor car business—founding the Detroit Automobile Company. He has agreed with his fellow directors who wished to restrict output to orders, and he resigned directorship in 1902. By himself he built some four cylindered cars and one called 999, won all the races for which it was entered. Then he formed the Ford Motor Company with a nominal capital of \$100,000 by 1926 its assets were valued at \$1,000,000,000. The stock was entirely held by F. and his son, who bought out the other stockholders. He introduced vanadium steel into motor construction, and in 1909 the company

standardised the 'T' model, which was the F. car known all over the world, and was superseded only in 1927 by the 'A' model.

In 1915 he turned his attention to his early preference, the farm tractor, and his Fordson tractor proved of notable use in Britain when there was a food shortage through the Ger. submarine campaign in the First World War. Within twenty-eight years of his start F. had put 20,000,000 cars on the road. His factories employed 200,000 persons, and comprised some fifty complete businesses. In 1914 he made known that throughout his plants there was to be a standard wage of \$5 a day, which at the time was nearly double the average figure of Detroit. Subsequently, when he realised that the old car had had its day, he shut down all his plants, did not re-open until the new models were ready, and then started afresh in full power. In 1940 he built the vast bomber plant of Willow Run. Through 1941-42 Willow Run had the appearance of mass-production's most spectacular failure; but afterwards it functioned to scale when F. had surmounted the difficulties imposed by labour, transport, and the conditions of gov. contracts. He is said to have been a scornful opponent of workers' welfare, but he always argued that no trade union could get for its members any benefit to compare with the F. standard wage. But in some things he moved with the times, and the H. F. hospital in Detroit is a free institution of unrivalled excellence, with the highest standard of comfort and equipment. A few miles out of Detroit, adjoining Greenfield, is the F. Museum of Amer. Hist., the main building of which produces, in Georgian brick, the noble Independence Hall of Philadelphia. That F. was a visionary, ignorant of much that quite ordinary people knew, but with goodwill for all is illustrated by the fact that in 1915-16 he visited Europe as leader of a peace party, whose members went to various neutral capitals in an endeavour to end the war. Yet, in spite of his character as an emotional visionary, he had a power of handling the practical things of life which has seldom been surpassed. In 1918 he ran unsuccessfully for the Senate, and in 1923 there was some talk that he would run for the presidency, but later he announced his refusal to stand against Mr. Coolidge. In the following year his acquisition of the Dagenham site, in addition to his Trafford Park and Cork works was announced. This was part of a post-war policy of expansion, and between 1931 and 1946 over 1,000,000 vehicles were manufactured at the Dagenham factory alone. He founded factories in many European countries, but his plant at Dagenham is the largest outside the U.S.A. He then went into the civil aviation business, and soon afterwards his all-metal monoplanes were on sale. The industrial empire which F.'s imagination and energy estab. was in due course to yield him an immense fortune; but wealth was never his goal. F. wrote four books concerning his own life's work and ideals: *My Life and Work* (1922), and *To-day*

and *To-morrow* (1926), both in collaboration with Samuel Crowther; *Philosophy of Labour* (1929); and *Moving Forward* (1930). See K. C. Thalheim, *Sozialkritik und Sozialreform bei Abbe Rathenau und Ford*, 1929.

Ford, John (c. 1586-c. 1640), Eng. dramatist, b. at Illyington, Devonshire. His mother was a sister of Lord Chief Justice Popham. F. matriculated at Exeter College, Oxford (1601), and in 1602 became a member of the Middle Temple. In 1606 he pub. his first work, *Name's Memorial*, an elegy on the death of the earl of Devonshire, with a dedicatory sonnet to Penelope, the earl's widow. In the poem he alludes to a lady, 'bright Lydia, the cruel, the cruel-subtle,' who had evidently scorned him. In the same year he issued *Honour Triumphant, or the Peers' Challenge*, a prose pamphlet, and also, appended to the latter, *The Monarchs Meeting*, a poem written in the stanza of Gray's *Elegy*. In 1613 his first comedy, *An Ill Beginning has a Good End*, was produced at the Cockpit. This play was never pub., and is not extant. In 1621 he collaborated with Dekker and Rowley in *The Witch of Edmonton*, a play, pub. in 1658. *The Sun's Darling, a Moral Masque* (1623-24, pub. 1656), is said to be Dekker's original revised by F.; but the masque is variously ascribed to Dekker, F., and Rowley. The episodes of Sir Arthur Clarington, Winnifred, and young Thorney are undoubtedly the work of F. Other plays and masques produced in collaboration are *The Fairy Knight* (masque) and *The Pristol Merchant* (1624) with Dekker; and *A late Murder of the Son upon the Mother* (1621), with Webster. In 1629 a comedy, *The Lover's Melancholy* (psychological, and indebted as to sev. passages to Burton's *Anatomy*), produced 1628, was the first of his plays to be printed. In 1633 his two best tragedies, *Tis Pity She's a Whore* and *The Broken Heart*, appeared. These are little inferior in impressiveness to the best works of Webster. His other plays are *Lore's Sacrifice* (1638) in which Bianca is one of the best drawn of all F.'s characters; *The Chronicle History of Perkin Warbeck* (1634), one of the best historical dramas in the language; *The Fancies Chaste and Noble* (1638), well constructed but marred by a ridiculous story; *The Lady's Trial* (1638 or 1639); and sev. lost dramas. F. is one of the most modern of the Elizabethans: he studied the sources of action and, as a psychologist, subtly analysed the human soul. As regards style, his verse is so steeped in the sweetness of lyric poetry that it sometimes seems hardly adapted to express the stormy passions of his characters. See A. C. Swinburne, *Essays and Studies*, 1875; and M. J. Sargeant, *John Ford*, 1935.

Ford (formerly Hueffer), Ford Madox (1873-1939), Eng. author, son of Dr. Francis Hueffer. His works include *The Heather* (1892); *The Queen Who Flew* (1894); *Ford Madox Brown* (biography) (1896); *The Face of the Night* (1904); *The Heart of the Country* and *The Fifth Queen* (1906); *Mr. Apollo* (1908); *Songs from*

London (1910); *Henry James: a Critical Study* (1914); *Thus to Resist* (1921); *Joseph Conrad* (1924); *New York is not America* (1927); and *The English Novel* (1930). He wrote some remarkable poetry (*Collected Poems* (1913); and *New Poems* (1927)); but his historical romances just missed being excellent. Yet, says Frank Swinnerton, 'the total effect created by Hueffer is less than the total effect created by men of insignificant talent.' He founded the *English Review* in 1908, and was a friend of Conrad (with whom he collaborated in *The Inheritors*, (1908) and *Romance* (1903)), Wells, and Galsworthy. See D. Goldring, *The Last Pre-Raphaelite*, 1948.

Ford, Richard (1796-1858), Eng. writer on art and travel; educated at Winchester and at Trinity College, Oxford. Was called to the Bar at Lincoln's Inn but never practised. From 1830 to 1833 he travelled in Spain, becoming intimately acquainted with the country and people, and spending much time at the Alhambra and at Seville. The work by which he is remembered is his *Handbook for Travellers in Spain* (1845), written at the invitation of Murray, the publisher. This is much more than a mere guide-book, and remains one of the earliest and best of travellers' handbooks, notably for its literary quality. He also wrote *Gathernings from Spain* (1846). An accomplished artist and art critic, F. was the first to make Velasquez generally known in England.

Fordingbridge, tn., Hampshire, England, on R. Avon, here crossed by a stone bridge 10 m. S. of Salisbury. There are flax-spinning and canvas industries. Pop. 3400.

Fordun, John of (d. c. 1384), Scottish chronicler. Little is known of his life. He is supposed to have been b. at F. in Kincardineshire, and to have been a secular priest and a chantry priest in the cathedral of Aberdeen. Between 1363 and 1394 he is said to have travelled on foot through Britain and Ireland in search of materials for his chronicle of Scotland. Of his *Scotichronicon*, or *Chronica Gentis Scotorum*, only five books are completed, and the work was continued in 1441 by Walter Bower, who finally brought the hist. down to 1437. The work is the chief authority for Scottish hist. before the fifteenth century. The best ed. of F.'s work is by W. F. Skene, 1871-72.

Forecasts, Weather, see METEOROLOGY.
Foreclosure, see MORTGAGE.

Foreign Debts, see PUBLIC DEBT.

Foreign Enlistment Act, 1870, an Act passed in 1870, which forbade the enlistment of any Brit. subject in the army or navy of any foreign state at war with any friendly state. The Act states definitely that no Brit. subject shall under any conditions enter into the service of any state at war with a state which is friendly to the Brit., save with the consent of the king, or by an Order in Council. The officers of the customs or of any port have full power to detain any vessel concerning which they hold information that she is proceeding to the aid of some foreign

state which is at war. This legislation was undoubtedly an immediate outcome of the celebrated Alabama case. Any ship so taken, together with all stores, arms, and equipment, is confiscated. It was under the provisions of this Act that the leaders of the Jameson Raid were punished (1895).

Foreigner, see ALIEN.

Foreign Exchange, see EXCHANGES; FOREIGN MONIES AND EXCHANGE RATES.

Foreign Jurisdiction. The administration of Brit. law in countries outside the dominion of the Crown is regulated by the Foreign Jurisdiction Act of 1890, extended by a further Act in 1913. The power of exercising jurisdiction in foreign countries may be acquired by the Crown as a result of treaty or capitulation, and is usually vested in the consular officers. The jurisdiction is generally limited to Brit. subjects or persons under Brit. protection, and covers civil and criminal cases. The Foreign Jurisdiction Act may also apply in a Brit. protectorate, where the ter. not having been annexed, remains outside the normal colonial administration. See also CAPITULATIONS.

Foreign Law. The Eng. courts do not take judicial notice of F. L., and the party who relies on a F. L. must prove it like any other fact. Strictly, all F. L. has, as such, no extra-territorial force; such effect as it has is by virtue of *comity* (q.v.), and unless specially proved in any particular case, the law of another state will be presumed to be similar to Eng. law. Written F. L. must be proved by the text or some authoritative collection or duly certified copy of the same; expert evidence in such cases being merely by way of secondary evidence. Foreign unwritten law is generally proved by oral evidence.

Foreign Legion, military unit formed of men who are foreigners to the country in whose service they are engaged. The F. L. par excellence is the Fr. *régiment étranger*, organised in 1831, and later forming a permanent regiment of seven battalions based on Algiers. Recruits were accepted for service of varying periods without proof of identity. A F. L. of Swiss and Gers. volunteered for Brit. service in the Crimean war. F. Ls. served in Spain in the Carlist war (1872-76), and in the Civil war (1936-39).

Foreign Marriages, see MARRIAGE AND MARRIAGE LAW.

Foreign Monies and Exchange Rates. Bank of England, Empire Exchange, and other rates, are given in the table opposite.

Foreign Office (England), that dept. of the executive through which negotiations with foreign powers are conducted. At the head of it is the principal secretary of state for foreign affairs, appointed from the dominant party in Parliament. The foreign secretary is assisted by three parl. under-secretaries, a parl. private secretary, who also go out with the gov., a permanent under-secretary and four assistant under-secretaries. It is needless to say that the post of foreign secretary is of such vital and commanding importance that it is essential to appoint to it a minister who, by reputation and

FOREIGN MONIES AND EXCHANGE RATES

(1) Bank of England Official, and Empire Exchange, Rates

	<i>Denomination</i>	1939 <i>Average rate to £</i>	<i>Nov. 1948 London Rate of Exchange to £</i>	
			<i>Maximum</i>	<i>Minimum</i>
Australia	Australian £	A.£1-2525	125½	125
Belgium	Belgian belga * or franc	*26-49	170½	176½
Brazil	Cruzerio (= 100 centavos)	82	75-4416	75-4416
Canada	Canadian \$	4-515	4-03½	4-02½
Czechoslovakia	Crown (= 100 halers)	—	202	201
Denmark	Krone (= 100 ore)	22-26	19-36	19-32
France	Franc	176-10	1063	1061
Lebanon	Lebanon £	—	8-85	8-80
Netherlands	Florin (gulden = 100 cents)	8-31	10-70	10-68
Dutch E. Indies	Florin (gulden = 100 cents)	8-31	10-70	10-68
New Zealand	N.Z. £	N.Z.£1-2425	101	100½
Norway	Krone (= 100 ore)	19-45	20-02	19-98
Portugal	Escudo (= 100 centavos)	110-07	100-20	99-80
Rhodesia	Rhodesia £	100	100½	99½
Union of S. Africa	S.A. £	S.A.£1	100½	100
Sweden	Krona (= 100 ore)	15-59	14-50	14-47
Switzerland	Franc	19-87	17-36	17-34
U.S.A.	Dollar	4-180	4-03½	4-02½

(2) Other Rates

Albania	Lek (5 lek = 1 franc)	—	201	201
Argentina	Peso (gold peso = 100 centavos)	19	19-68	19-63
Austria	Schilling (= 100 groschen)	—	40-86	39-74
Bolivia	Boliviano	141-4	170-50	168-02
Bulgaria	Lev	375	1158	1158
Burma	Rupee	13-38	1s. 6d. (value of rupee in shillings and pence)	1s. 5d.
Ceylon	Rupee	13-38	1s. 6d. (value of rupee in shillings and pence)	1s. 5d.
Chile	Peso	116½	173-60	173-30
China	Yuan	—	60	60
Colombia	Peso	7-59	7-00	7
Costa Rica	Colon	25-16	22-55	22-55
Cuba	(= about 18 cents U.S.)			
Dominican Rep.	Dollar	4-386	4-03	4-03
Ecuador	Dollar	4-386	4-03	4-03
Egypt	Sucre (= 20 cents U.S.)	66	55-40	52-92
Eiro	Piastro	97½	97½	97½
Ethiopia	(100 piastres = £1 (gold))			
Finland	£	£1	£1	£1
Greece	Ethiopian \$	—	10	10
Guatemala	Mark (= 100 peni)	217½	547	542
Haiti	Drachma	515	32,000	32,000
Honduras	(77 drachmas = 1 \$ U.S.)			
Iceland	Quetzel (= 1\$)	4-386	4-07	3-98
India	Gourde (= 20 U.S. cents)	22-4	20-15	20-15
Indo-China	Lempira (= 50 U.S. cents)	8½	8-06	8-06
Iraq	Krona	—	26½	26
Iraq	Rupee	1-38	1s. 6d.	1s. 6d.
Iraq	Piastro (= 10 francs)	—	62-80	62-15
Madagascar	Iraq dinar	1 dinar = £1 sterling		
	Franc	175 Fr. francs	531	531

FOREIGN MONIES AND EXCHANGE RATES: (2) Other Rates—continued

	<i>Denomination</i>	1939 <i>Average rate to £</i>	<i>Nov. 1948</i> <i>London Rate of Exchange to £</i>	
			<i>Maximum</i>	<i>Minimum</i>
Mexico	Peso	—	28	27
Nicaragua	Cordoba (=100 centavos)	24	22·27	20·05
Pakistan	Rupee	—	1s. 6d	1s. 6d.
Palestine		1 Israel £ = £1 Sterling		
Panama	Dollar	—	4·03	4·03
Paraguay	Peso	—	12·56	12·31
Persia	Rial (100 rials = 1 pahlev; 1 rial = 100 dinars)	80·50	130	128
Peru	Sol	24½	26·16	26·10
Philippines	Peso	—	8·14	8·09
Poland	Zloty (=100 grosz)	23½	403	403
Rumania	Leu (=100 bani)	657½	605½	605½
Salvador	Colon (=50 cents U.S.)	11·20	10·17	10·04
Siam	Baht or tical (=100 satang)	10·91	10·51	9·90
Spain	Peseta (=100 centesimos)	42·45	45	44
Sudan	Pound	97½	97½	97½
Turkey	T.L.	—	11·39	11·28
Uruguay	Peso (=100 centesimos)	9	9·306	9·239
Russia	Rouble	23·75	21½	21½
Venezuela	Bolivar (=32·67 U.S. cents)	14·15	13·51	13·40
Yugoslavia	Dinar (100 dinars = 9·13 Swiss francs)	197½	201	201

attainments, is as far as possible above the rancour of merely party politics. In the discharge of the prin. function, which is nothing less than the formulation of Brit. foreign policy, the foreign secretary is responsible both to the Cabinet (*q.v.*) and to Parliament; and for its due fulfilment he is necessarily in constant touch with the ambass., envoys, plenipotentiaries, or other foreign representatives in England, and with Brit. diplomatic agents abroad, the latter of whom it is his duty to advise; and through our ambass. and foreign representatives in England he should endeavour, so far as is consistent with Brit. state interests, to promote cordial relations with foreign powers. Among the purely formal duties of a foreign secretary are the reception of new ambass. and their presentation to the king. He has an extensive patronage, appointing not only our ambass. to foreign courts, but numerous diplomatic agents and consular officers. Among his other duties are the superintendence of the preparation of trade statistics supplied by Brit. agents abroad, and the pub. and distribution of the same to the different chambers of commerce; the granting of passports, and the protection of Brit. subjects abroad who have suffered injury or wrong whilst abroad. The Dept. of Overseas Trade (whose parl. head is one of the parl. under-secretaries of state of the F. O.) is really a joint dept. under the F. O. and the Board of Trade. In conjunction with the rest of the Cabinet the foreign secretary carries into execution the treaty-making prerogative of the Crown (*q.v.*).

The merging of the F. O., the diplomatic, and the consular service into a combined foreign service was one of the reforms which Mr. Anthony Eden (*q.v.*) announced in Parliament in June 1941. Another reform was in the system of recruiting for the service. These reforms were the outcome of the report of Sir Malcolm Robertson to the foreign secretary on the reform of the foreign service, a report which, in part, recommended the acceptance of proposals urged upon the Brit. Gov. by the MacDonnell Commission in 1911; while the abolition of the means test for the diplomatic service was one of the major reforms of 1919, reforms which, however, did not seriously alter the character of the service up to as late as the outbreak of the Second World War. If it be true that a diplomatic service reflects the complexion of a society of which it is the expression, then most embassies to-day require men capable of understanding the habits and purposes of classes outside the *élite* circle to which the average Brit. diplomat generally restricts himself (*see* on this H. Butler, *The Lost Peace*, 1942). The prin. change, however, in the reforms of the foreign service, as explained in the Commons (March 18, 1943) may be said to meet this need, that change being the disappearance of the system under which diplomacy was the business of a small class whose sphere was confined to a few drawing-rooms and chancelleries, although members of the F. O. were not even at that time drawn from so restricted a class or so limited in their ideas. As envisaged by these

reforms, diplomacy must now be based on the representation of the whole nation, and must comprehend the whole life of the nations to which it is accredited. An even greater change is the growing fusion of politics and economics in foreign affairs. It should, however, be realised that the function of the F. O. is interpretative, not positive, i.e. it does not bear responsibility for foreign policy.

Foreign Relations Committee. The U.S.A. have a secretary of state in the president's Cabinet who deals with foreign affairs. The president, however, is himself the responsible official for dealing with international subjects, but his decisions need the endorsement of two-thirds of the Senate. This arrangement, as laid down in Section 2 of Article Eleven of the Constitution, was planned with the object of maintaining a democratic hold upon the foreign policy of the gov. The difficulty of such a large body being required to deal with issues, many of which are too delicate and intricate in nature to permit of open discussion, and the fact that the president has no absolute guarantee that his actions will be endorsed, has led to the estab., within the Senate, of a "l. l. c.", the restricted and qualified powers of which are fully realised by other nations. This committee works in close touch with the Senate and the president. Even when the Foreign Affairs Committee approves an action by the president, it is not always certain that the Senate will approve.

Forland, North and South, two capes of England, projecting from the E. coast of Kent. They are composed of chalk cliff. N. Forland is situated in lat. 51° 22' 28" N., and long. 1° 26' 48" E., and is 66 m. E. of London. A lighthouse is placed with a fixed light, 188 ft. high, visible 20 m. off. S. Forland is 16 m. S. of N. Forland, situated in lat. 51° 8' 23" N., and long. 1° 22' 22" E. It juts out into the Dover Strait, 4 m. N.E. from Dover. There are here two fixed lights which are visible at distances of 22 m. and 25 m. Near here was fought a naval battle in 1666, between the Eng. under Albemarle and the Dutch under De Ruyter.

Forensic Medicine, see MEDICAL JURIS-PRUDENCE.

Foresore, see SEASHORE and COAST PROTECTION.

Forest (*Flemish Vorst*) tn. in the prov. of Brabant, Belgium, and suburb of Brussels, 3 m. to the S.W. of the city. Pop. 47,300, engaged in agriculture and manufs. of stoves, footwear, carpets, chemicals and soap. It has breweries and malt houses.

Forest, Lee De, see DE FOREST.

Forest and Forest Laws. Forest is defined by Manwood, the old authority on the Forest law, as being 'a circuit of woods, grounds, and pastures, known in its bounds, and privileged for the abiding of wild beasts and fowls of forest, chase, and warren, to be under the king's protection for his princely delight.' According to Coke, the royal forests in his time appear to have been sixty-nine in number, while

the origin of by far the greater part was lost in remote antiquity. The four prin. forests in England were the New Forest, Sherwood, Dean, and Windsor. Among the others were Epping (Essex), Dartmoor (Devon), Wichenwood (Oxfordshire), Salcey, Wittlebury, and Rockingham (Northamptonshire), Waltham (Lincolnshire), and Richmond (Yorkshire). Prof. Freeman has pointed out that afforestation in its older connotation had nothing to do with trees, and simply meant putting a tract of land outside the common law in order to secure for the king, by special laws, the free enjoyment of the pleasure of hunting. The forests were the private property of the king, and trespassers were so barbarously punished, that one of the chief things insisted upon in the early national demand for the reform of the forest laws was the mitigation of the severe code of punishments. The policy of afforestation of William I. was continued by his immediate successors to the throne, but although the forests were strictly guarded by the Conqueror, no forest laws are attributed to him. Subsequently, in the reign of Henry I., a system of forest laws, with special courts for their administration, was estab. and developed by Henry II. These courts were (1) the Court of Attachments, or Woodmote, held every forty days to punish offences against vert and venison (trees and covert and game); (2) the Court of Sweinmote, held three times a year, originally for business relating to agistment, but later to punish general offences under the forest laws; (3) the Court of Regard, held triennially, for the expeditation of dogs, i.e. the cutting of the claws in such a way as to prevent their use in hunting; and (4) the Court of Justice Seat, held before the itinerant justices of the F.s. for the trial of all causes connected with F.s. Besides the justices, the officers were the wardens, verderers, foresters, agisters, regarders, keepers, bailiffs, and beadle. The assize of Woodstock of 1184 made attendance at the forest courts compulsory, and heavy fines were extorted for every breach of the forest law. The first substantial concessions were those granted by Magna Carta, under which all forest made by John were to be disafforested, and all bad customs connected with forests abolished. Then came the *Carta de Foresta* of Henry III., the first separate charter of forests, which disafforested private lands improperly afforested, and abolished the punishments of death and mutilation for offences against the forest laws. This charter was confirmed by Henry III. in 1225, but so often infringed by him and Edward I. that the latter monarch had to promise and carry out reforms under the *Articuli super Cartas* of 1300. From the time of the *Confirmatio Cartarum* of 1327 the forest laws began to fall into disuse, and the oppressive powers vested in the Crown had almost ceased to be exercised at the time of the Stuart dynasty, when Charles I. revived them with the object of replenishing his empty exchequer by fines for trespass. This was one of the grievances to which the Long Parliament directed its attention, and

ForeSTALLING

from the passing of the 16 Car. I. c. 16, the whole forest organisation fell into a state of decay. In 1817 the offices of warden, chief justice, and justice in eyre of the F.s. were abolished, and the powers attached to these offices, relating mainly to the revenues of such royal forests as remain, were vested in 1829 in the Commissioner of Woods, Forests, and Land Revenues. In 1832 the powers of the commissioner passed to the predecessors of the Commissioners of Woods and Forests, an emanation of the Commissioners of Works and Public Buildings. See FORESTRY.

ForeSTALLING, originally the practice of buying goods before they reached the market in order to raise the price of them. There were laws against this practice, but they were repealed by statute 7 and 8 Vict. c. 24, and it is now considered a lawful way of trading. See ENgrossing and REGRATING.

Forest City: 1. Tn. in Susquehanna co., Pennsylvania, U.S.A., 5 m. N. of Carbondale. Has silk mills and is a centre of a furnishing and mining dist. Pop. 5000. 2. Also the name of three vils. in Colorado, Iowa, and N. Dakota.

Foresters, Ancient Order of, estab. in 1834. It is one of the larger friendly societies of the class designated 'affiliated' societies in the report of the royal commission of 1870, that is, having a central body to the funds of which the branch bodies or 'courts' contribute. The objects of this order, which was estab. in 1834, are to secure to its members, their wives, husbands, and other relatives or dependants weekly allowances during sickness or other infirmity, in old age (*i.e.* after fifty), or in widowhood, also to provide sums at death or during unemployment or other distress and by way of endowment insurance. The Order administers the National Health Insurance Acts through its central office, dists., and court branches (see on general objects of a friendly society, FRIENDLY SOCIETIES). The Order has an approximate membership of 712,000, and its funds (in 1938) exceeded £15,100,000.

Forest-fly, see HORSE-FLY.

Forest Gate, populous suburb of E. London in the co. bor. of W. Ham, 5 m. from the city of London. Pop. 19,000.

Forest of Dean, see DEAN, FOREST OF.

Forestry: *Historical.*—Forest may be described as an area set apart for the production of timber and other forest produce, or which is expected to exercise certain climatic effects or to protect a locality against injurious influences. Probably the greater part of the dry land was formerly covered with forests which consisted of a variety of trees, and which were grouped according to climate, soil, and configuration of the several localities. When old trees reached the limit of existence they disappeared and younger trees took their place, and conditions for uninterrupted continuation of the forest were thus rendered favourable. The result of this was a healthy and vigorous production by the creative powers of soil and climate. The interference of man broke this continuous chain and gradually

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ForeSTRY

the area under forest has been greatly reduced. Then the estab. of domestic animals showed the first decisive interference in the life of the forests. Forests were burnt down in order to obtain pasture and later for agric. purposes. In modern times the ruthless cutting down of trees for timber is a menace to the already decaying supply of wood and other forest products.

Character and distribution of Forests.—The character and distribution of the now remaining forests differ immensely. Generally speaking large forests consist of a number of different species of trees, but there are also forests containing trees of one species only. In most of the tropical forests hundreds of species are to be found on a comparatively small area. In Burma, for example, there are thousands of species, while in Sind there are only ten species. In central Europe exist forests of fifty species, while in N. Europe the forests contain only half a dozen. Generally speaking, however, it may be said that the tropics and their adjacent countries of the earth unmodified by considerable elevation, contain broad-leaved species, such as palms, bamboo, etc. In these parts most of the hardest timbers, such as teak, ebony, and mahogany, are found. The N. countries, on the other hand, are rich in conifers. Just as the temp. varies as one travels N. or S. from the equator, so, in travelling in the same directions, various characteristics of vegetation dependent upon climatic conditions may be seen. The countries between central Africa and N. Europe exhibit nearly all the varieties of forest trees. S. and N. of the equator is a large belt consisting of hardwood. In the Sahara and on the Mediterranean coasts are forests of oak and cork. In Italy the oak, olive, and chestnut are predominant, and ash, sycamore, beech, birch, and certain pine species may also be found. The Swiss and Ger. forests contain chiefly silver fir and spruce, and the Baltic countries produce forests of Scots pine, spruce, and birch. In Siberia the forests consist of larch, hornbeam, willow, and poplar. In India the forests are greatly influenced by elevation and rainfall. In dists. where there is heavy rainfall the forests consist of evergreens, such as fig, palm, bamboo, and indiarubber trees. In dists. where rainfall is less deciduous forests appear, such as teak (*q.v.*), sal (*q.v.*), and other valuable trees. Where the rainfall is very slight the vegetation is sparse, and places where rainfall is nil are desert. The Himalayas provide an excellent illustration of the effect of elevation upon the character of forests. Here are found forests which contain, according to the elevation, pines, firs, d^r-odars, oaks, chestnuts, laurels, and bamboos. As the conditions vary from sub-tropical to arctic, so the character of the forest also varies. In Australia most of the trees belong to the eucalyptus genus. Over 200 species have already been found. Some of these trees reach an enormous height. In N. America tropical and sub-tropical forests consisting of evergreen broad-leaved species and pines are found.

In the Atlantic region the forests consist of broad leaved deciduous trees and pines. In Canada larches, spruces, and firs are predominant. Proceeding W from the Atlantic regions the forest changes into shrubby vegetation, and this into prairies. Towards the Pacific coast extensive forests of pine, larch and fir are found.

Use of Forests—Forests are absolutely indispensable to mankind as regards both their direct and indirect value. They are indirectly valuable through their influence on climate, stability of soil, regulation of moisture, healthiness and beauty of the country. Their direct value is through

regulate the water supply, tend to reduce violent floods and produce a more sustained feeding of springs, (5) they assist in preventing denudation, erosion, land slips and avalanches, (6) under certain conditions they improve the healthiness of a country and help its defence (7) they increase the beauty of a country and tend to produce a healthy aesthetic influence upon people.

The direct utility of forests is due (1) to the produce they yield, (2) to the capital they represent, and to the work they provide. The produce consists of timber and firewood, which are both necessities



OLD FOREST OAKS IN THE LAND

the produce they yield. Bare land is exposed to the full effects of the sun and air currents and the climatic conditions produced by these agencies. Land which is covered with a growth of plants and especially with dense forest enjoys the benefits of certain agencies which modify the effect of sun and wind upon soil. The chief of these modifying agencies are (1) crowns of trees which intercept the rays of sun and falling rain and reduce radiation at night, (2) leaves, flowers and fruits together with certain plants which grow in shade of trees form a layer of mould this protects the soil against rapid change of temp. and greatly influences the movement of water in it, (3) roots of trees bind the soil together. By careful experiment the following results proving the utility of forests have been obtained. (1) Forests reduce the temp. of air and soil to a moderate extent and render climate more equable, (2) they increase the humidity of the air and reduce evaporation, (3) they tend to increase the precipitation of moisture, (4) they help to

for the daily life of people. Conifers are the most important timber trees for economic purposes. They are found in large quantities in the Baltic provinces and in America. Iron now serves in many ways particularly in the building trade where timber was once used and coal largely takes the place of firewood. Wood however has displaced other materials. Spruce wood is now used to manufacture a fabric closely resembling silk. The minor products of the forest are numerous and essential to mankind. The yield of fodder is of the utmost importance in countries which are subject to periodic droughts. In many places it is impossible to grow field crops successfully without leaf mould and brushwood. The industries maintained by products of forests are numerous and include commercial fibre, tanning materials, dyestuffs, lac turpentine, resin, rubber, and gutta percha. The United Kingdom imported during 1944 wood and timber to the value of £12,952,448 (exclusive of rubber and paper making material), in 1948 the total value was

£93,242,213, of which soft wood accounted for £51,333,930, pit-props £13,332,000. The chief countries whence these imports came in 1948 were Canada, £26,753,687 (excluding Newfoundland, £636,845); Finland, £13,928,877; Sweden, £13,180,392; Germany, £9,864,926; U.S.A., £7,109,292; Yugoslavia, £4,215,090; Brit. W. Africa, £3,144,046. Imports of paper-making materials (*i.e.* pulp of wood, esparto, linen and cotton, etc., rags) were £17,737,915 in 1938 and £52,278,303 in 1948. In 1938 the total imports of manufts. of wood and timber was £6,286,774; in 1948, £12,340,868 (including furniture and cabinet ware, £2,143,150; plywood £7,879,745; wooden containers, bobbins and reels, prefabricated houses, £2,883,441). In Russia and in other N. countries the people are largely dependent on the produce of forests. Their houses are almost universally made of timber; wood is everywhere used for fuel, and they often employ a slip of birch wood, which is lighted, as a candle. Potash, which is made from the ashes of burnt trees, is exported in large quantities. From the wood of the birch the Russians procure a species of tar, empyreumatic oil, which is used in dressing that kind of leather commonly known by the name of Russian leather, and much employed in book-binding.

The capital employed in forests consists chiefly of the value of the soil and the growing stock of timber. The latter is generally of much greater value than the former. The rate of interest yielded by capital invested in forests may under proper management be placed equal to that yielded by agric. land. Forests require labour in many ways, such as formation, tending, and harvesting; transport of forest produce; and industries which depend on forests for their chief material. The greatest amount of labour is required in the manuf. of raw materials yielded by forests, *e.g.* chair-making at High Wycombe, Buckinghamshire, England, from beeches in the adjoining country, which employs over 20,000 workmen. One great feature of forest work is that it can be done at seasons when field crops do not require attention, thus fitting in admirably with agric. work.

The Supply of Timber.—The extent of land under forest varies in the different countries, and thus some countries are able to export large quantities of timber, while others are forced to import the necessary quantities. The chief producing countries of Europe in their order are Russia, Sweden, Finland, Germany, and France. All the other countries either have only enough for home consumption, or import timber. W. Africa exports hardwoods and imports coniferous timber. Cape Colov and Natal import considerable quantities of pine and fir wood, and some oak. Australia exports hardwoods, and New Zealand, kauri pine, and they import larger quantities of light pine and timber. The U.S.A. import nearly as much from Canada as they export. Canada exports large quantities of timber. The quantity of land under forest in the

dominion amounts to more than 1,000,000 sq. m., or 31 $\frac{1}{4}$ per cent of the whole area. There is enormous forest wealth, with which she might supply nearly all the other countries deficient in material. The policy of the dominion and provincial govs. is to dispose of the timber by means of licences to cut, rather than to sell timber outright, thus retaining the ownership of the land and controlling cutting operations. Protection of timber from fire is afforded by each of the prov. govs. maintaining an organisation which co-operates with owners and licensees of timbered areas. The most important single development in forest fire protection in late years has been the use of aircraft for the detection and suppression of forest fires. The most valuable timber, the white pine, is gradually being exhausted; great forests of spruce are being rapidly destroyed, and forests of Douglas fir have been attacked for export to the U.S.A., and other countries. In comparing stocks of the various countries it has been found that a sufficient quantity of hardwoods is available, but the only countries which are able to supply coniferous timber for export on a large scale are Russia, Sweden, Norway, Austria, Hungary, and Canada. In some countries there is no room for extension of land under forest, but in Great Britain and Ireland no such plea can be made. There are about 2,000,000 ac. of waste land, and about 12,500,000 ac. of mt. and heath land generally used for light grazing. If one-quarter of that area were placed under forest it would produce all the timber now imported which can be grown in Great Britain, that is to say, about 95 per cent of the total. The serious encroachments made upon Brit. forests during the First World War, in order to supply enormous quantities of wood for trench-supporting purposes, and the presence of numbers of Canadian lumbermen created wide national interest in afforestation, with the consequence that a F. commission was set up by the Forestry Act of 1919. It is the duty of the commissioners to promote the interest of F. and develop afforestation with the aim of increasing the supply of timber in Great Britain. Including the former Crown woods, which have passed into the care of the commission, the dept. has acquired over 1,270,000 ac. of land, of which 60 per cent are plantable, and they have planted over 462,000 ac. Adequate grants are supplied by the gov.

British Forests.—The oak and the beech are natives of Great Britain. The elm was introduced at an early date. Each of these trees has its appropriate soil. In the W. part of the co. of Sussex we have two distinct belts of country, each strongly marked by the character of its vegetation. To the N. there is a strong and deep clay, admirably adapted to the growth of oak. Then come the chalk hills where the luxuriant growth of the beech attests that this tree has found its congenial soil. The elm is not met with N. of Stamford in Lincolnshire. The elm seen in Scotland and the N. of England is the wych elm, a different species, growing in a more

straggling form, with pendent branches and a larger leaf. Its wood is very unlike that of the Eng. elm, and more resembles that of the ash. In the approaches to some of the royal palaces in Spain are some rows of elms, which, we are assured by Evelyn, were transplanted from England by Philip II, husband of Queen Mary of England, the elm not being a native of Spain. In addition to the above-mentioned trees, the ash, the maple, the sycamore, and small leaved limes may be enumerated as growing wild in Great Britain. The chief forests of England are the New Forest, the Forest of Dean, and Epping Forest.

the Crown, inclosed and cultivated, and the residue belongs to the Crown, but subject to the rights of common of a large body of owners and occupiers of cultivated lands in the neighbourhood of the forest. *The Forest of Dean*, about 19,000 ac in extent, is another of the few remaining royal forests, which has come under the consideration of Parliament in recent years, and where the policy of maintenance has prevailed over that of enclosure. The forest lies in the hundred of St Briavels between the estuary of the Severn and the R. Wye, about 12 m from Gloucester. The Crown is the owner of the soil and of all the timber growing on it.



MATURE SCOTS PINE

The New Forest was originally a royal forest. The origin of royal forests is lost in antiquity. There are said at one time, in England alone to have been sixty eight forests in the possession of the Crown. All the sixty eight forests have long ago been disafforested, in the sense that the sovereign has no longer the privilege of maintaining deer and other game in them for sport, protected by special laws and tribunals. A few only exist in the popular sense of the term, that the land is still uncultivated and covered wholly or partially by woods such as the New Forest, the Forest of Dean, Epping Forest, Windsor Forest, and the Forest of Dartmoor. The New Forest (Hampshire) was created by William the Conqueror, who in doing so, is popularly believed to have devastated a wide dist. of cultivated land, demolished churches, and converted the land to the use of wild animals. The forest now practically consists of 65,000 ac, of which a little over 2000 are the demesne lands of

the forest, about 4000 ac consist of heath and open land, the residue is planted with oak trees. *Epping Forest* consists of a little over 6900 ac of wood land open to the public at all points extending for a distance of nearly 13 m from W instead, on the confines of London to beyond the vil of Epping with an irregular breadth at its widest part of about 1 m, and in its narrowest parts of about half a mile. It is densely covered with timber consisting of horn beam, beech, and oak trees. *THE AFFORESTATION, DARTMOOR, DEAN FOREST OR LIVING, FOREST AND FOREST LAWS FORESTRY COMMISSION*

Forestry Commission, body corporate appoint quinquennially under the Forestry Acts 1919-27, and charged with the general duty of promoting the interest of F., the development of afforestation and the production and supply of timber in Great Britain. The Forestry Act of 1945 removed the independence of the

then existing F. C., and created a new commission for which the Brit. and Scottish ministers of agriculture were to take political responsibility. But the F. C. was maintained, however, as the expert advisory and executive authority. The proposals of the F. C. in their white paper on post-war forest policy (Cmnd. 6447, June 1943) contemplate a great expansion of the forest area of Great Britain, from between 5 and 6 per cent of the total land area to between 9 and 10 per cent, mainly by the new planting of about 3,000,000 ac. of rough hill pasture and moorland. In addition they recommend direct or indirect executive control over 2,000,000 ac. of existing private woodland, much of which had been cleared and felled during the war, and required replanting. See also AFFORESTATION; FORESTRY.

Forez, former co. of France, partly corresponding to the dept. of Loire. It was united to the Crown under Francis I. in 1532.

Forez, Monts du, mts. in France, forming a branch of the Auvergne. They are situated between the rvs. Allier and Loire. Highest peak, Piorre sur Haute (5380 ft.).

Forfar, cap. of the co. of Angus, is a royal and parl. burgh of Scotland. It is situated in the valley of Strathmore, 13 m. N.N.E. of Dundee. Its chief industry is the hnen manuf.; there are also jute factories, tanning works, iron foundries, bleaching works, and breweries. F. was a royal residence of Malcolm Canmore and his queen Margaret. David I. made the tn. a royal burgh in 1124-53, and in 1308 Robert Bruce destroyed the castle. F. unites with Montrose, Arbroath, Brechin, and Inverbervie in returning one member to Parliament. Pop. 9600.

Forfarshire, see ANGUS.

Forfeiture: 1. Denotes the divesting of property or the loss of rights entailed by law as a consequence of some crime or breach of condition. Formerly any conviction and attamder (*q.v.*) for treason or felony was followed by the transfer to the Crown or the feudal superior of the person convicted of all his lands and goods. Since the passing of the Forfeiture Act, 1870, F., in this sense of the word, may be said to be practically obsolete. By that Act it is provided that no conviction for any treason, felony, or *felo de se* shall cause any attamder, forfeiture, or escheat. But the Act does not affect the consequences of outlawry or the putting of a person outside the protection of the law for refusing to make himself amenable to legal process. Apparently F. may still follow on conviction for misprision of treason (*q.v.*). But the Forfeiture Act further provides that the property of a convicted felon may be committed to the custody and management of an administrator appointed by the court, or in default of such administrator, to the management of an interim curator appointed by magistrates on an application made on behalf of the convict or his family. The management of the convict's estate, whether by an administrator or curator, is, of course,

entirely in the interests of his family; but the Act allows the court to order a convicted felon to pay a sum not exceeding £100 as compensation for loss sustained by any person in consequence of the felony. But a conviction for treason or felony, where the sentence is at least imprisonment for more than twelve months, or if less, with hard labour super-added, entails the loss of any military, naval, or civil office, or any other public employment or eccles. benefice or pension or superannuation allowance, unless a pardon is received within two months after conviction, or before the filling up of the office if the pardon comes at a later period. Furthermore, sentence completed, the felon until pardoned is debarred for the future from the above offices, and from sitting in Parliament or exercising the parl. or municipal franchise. 2. F. also denotes the loss of land or hereditaments consequent on a breach of covenant between landlord and tenant. But the right to take advantage of a F. may be waived by any act of the landlord which recognises the continuance of the title of the tenant, as, for example, the acceptance of rent by him in respect of a time subsequent to the act by which the F. was incurred. Equity, however, has for long given a tenant a right to apply for relief upon certain terms, such as payment of compensation to the landlord. 3. F. in the language of statutes is used to denote 'penalty' (see FINE). 4. The term is now used to denote the seizure by revenue officers, the police, or other authorised persons, of goods in regard to which some breach of the law has been committed. 5. Failure to perform the condition of a bond on the part of the obligor (see BOND) formerly entailed a penalty. Equity, however, has long relieved the obligor from F. of anything more than the other party was in conscience entitled to be paid. The like observations apply to the case of foreclosure as between mortgagor and mortgagee. 6. As to F. of contraband of war see DECLARATION OF LONDON. Other uses of the term, such as F. of marriage—the penalty imposed on a ward who married contrary to the wishes of a guardian—and F. for waste of a freehold inheritance, are obsolete. See also CONFISCATION.

Forged Transfer Acts, 1891 and 1892. These Acts empower a company to make cash compensation out of its funds for any loss occasioned by a forged transfer of its shares or stock, or by a transfer under a forged power of attorney. It is always desirable to set aside a fund exclusively for such compensation, because the title of the true owner of shares can never be affected by a forged transfer, and he can always compel the company to recognise him as the holder of the shares so transferred, and to cancel the forged transfer. The Acts enable a company to form a compensation fund by insurance or out of reserve capital, or in any other way it may resolve upon; and it may also borrow on mortgage to effect the same object. If the company elects to create the fund by insurance it may do so by charging

transfer fees not exceeding one shilling per £100, and not less than threepence. The Acts also empower a company to guard itself against loss from forged transfers by imposing reasonable restrictions on the right to transfer shares or stock, as, for example, by giving the directors the right of veto. See Buckley on *Companies and Limited Partnerships Acts*; and Palmer's *Company Law*.

Forgery, falsification or alteration of any document or writing with intent to defraud. The crime is only a misdemeanour at common law; but as commerce developed and paper credit became proportionately extended, many Acts were passed enumerating the most important classes of commercial and official documents, and making it a felony, punishable in most cases with penal servitude for from three years to life or imprisonment not exceeding two years, not only to forge or alter but also to alter or 'put off' any such document knowing the same to be forged. There can be no conviction for statutory F., unless the instrument purports on the face of it to be valid for the purposes for which it was created; her e n forged cheque with no signature .^o it w^{ll} sustain at most only a charge of F. at common law. F. only applies to documents in writing, therefore passing off a counterfeit picture for that of a particular artist by painting his name in the corner is not F., though it may constitute obtaining by false pretences. F. implies a general intent to defraud and not necessarily an intent to defraud any particular person. It may be noted that an instrument may be a F., even though the forger has put his own name to it, e.g. if A transfers shares to B, and subsequently with a fraudulent intent purports to assign the same shares to C by a signed transfer, the latter instrument is a F. See also COINING.

Literary forgery means the passing off of spurious literature as the work of well-known writers. See LITERARY FORGERY.

Forgery in Art, or Faking—The executing of a new or altering of an existing work of art with the intention of passing it off as the work of a particular famous artist or of a well-known 'school' or period—usually that of the old masters. The art of faking—a source of considerable amusement and excitement to the world at large—is a serious matter for dealers, collectors, etc., and the ever-increasing resources of science are needed and used to the full in this battle of wits in which the unravelling of a good piece of faking is rather like the unfolding of a first-class detective story.

Faking can take many forms: complete copies, touching up and additions, imitations, transpositions, etc., 'variations' in the style of'. Methods of detection include examination of technique and materials and details of costume, inscriptions, furnishings, etc. The general run of faking is crude enough and usually designed to be accepted as the work of a minor artist of the period currently most popular with collectors: real artistic talent is more likely to interfere with

slavish imitation and strike a discordant note. There are, however, fakes which have genuine merit, e.g. the Renaissance sculptures of Giovanni Bastiani, which have a place of their own in the Victoria and Albert Museum and Rouchomovsky's famous gold bottle. The Van Meegeren (q.v.) case in 1948 concerning forged Vermeers and de Hoochs was typical of the interest aroused in art F.: here the forger seemed to have a genuine talent perverted by admiration of his own cleverness. There are at present only two collections of avowed fakes—Dr. Ruhe-mann's and that of the scientific dept. of the Courtauld Institute of Art, and these are invaluable for teaching purposes. See O. Kurz, *Fakes: a Handbook for Collectors and Students*, 1948; and H. Tietze, *Genuine and False*, 1948.



FORGET-ME-NOT

Forget-me-not, popular name of *Myosotis palustris*, a plant belonging to the Borage family. It grows abundantly in damp places throughout Britain, and flowers all through the summer and autumn. The stem is succulent and grows to about 1 ft. in height. The flowers are blue and have a five-cleft calyx. Seven other species of *Myosotis* are common, and many are cultivated in gardens; *M. alpestris* is a rock plant and *M. lithospermifolia* has the largest flowers of the genus.

Forging, see ANNEALING; DROP-FORGING; WILDING.

Forio, seaport and com. of Italy on the Ischia, in the circle and 16 m. W.S.W. of Pozzuoli. It is noted for its warm mineral springs. Pop. 7200.

Fork, implement used for different purposes, and having two or more points or prongs. The various kinds of F. include Fs. for the table, pitch-Fs., hay-Fs., and tuning-Fs. (q.v.). The table-F. does not seem to have been used in England before the reign of Charles I. The oldest Eng. F. known is at present in the Victoria and Albert Museum, London. It was made for John, earl of Rutland in 1632, and has two prongs. Fs. are made of various materials, such as silver, silver plate, white metal, and steel. The making

Forli

of F.s. consists first in forging the tang, shoulder, and shank, and the piece from which the prongs are made. The other processes are the grinding, polishing, and hafting or fitting into the handle. The hay-F., used for turning and tossing hay, and the pitch-F. used as a garden implement have long wooden handles—occasionally short ones—and usually two prongs called tines. There is also a three-pronged F. used for some purposes in agriculture. The tuning-F., made completely of metal, has two prongs and is tuned to A above middle C. The method of producing this note is that of striking the tuning-F., which vibrates and produces the required sound.

Forlì: 1. Prov. of Italy in the div. of Emilia, central Italy. Area 725 sq. m. Pop. 300,000. 2. Cap. of the prov. of the same name, situated about 40 m. S.E. of Bologna, and at the foot of the Apennines. Its cathedral (San Girolamo) and churches are noteworthy on account of their works of art by Cignani, Guido, and others. It also contains an art gallery and a citadel dating back to 1361, and now used as a prison. Its manufs. are varied, including silk and cloth. The tn. itself, Forum Livii, is said to have been founded during the third century B.C. In the Second World War the Gers. mined buildings and shelled the city after the Allies occupied it in 1944. The monumental part of the cathedral, including the cupola with Cignani's frescoes, escaped damage. The church of S. Biagio was destroyed and with it Ferrucci's tomb of Barbara Mandrefi. The clock-tower of the public hall was demolished by the Gers., and the main building damaged, and the picture gallery and museum sustained some injury, but their collections had been moved to safety. Pop. about 58,000.

Form: 1. In philosophy means that which makes matter a determinate species (see FORMALISM). 2. in music, means the plan upon which a piece of music is constructed, e.g. Sonata F., which implies two prin. sections, the exposition, consisting of first and second subject specifically related, and the development or working out, leading to recapitulation of original subjects in different keys. Other F.s. in music are fugue, rondo, scherzo (q.v.).

Formaldehyde ($H_2\text{CHO}$), one of the organic substances called aldehydes which are formed when the primary alcohols lose two atoms of hydrogen, hence alcohol dehydrogenatum. F. is prepared by oxidising methyl alcohol by passing air saturated with the alcohol vapour over red-hot platinised asbestos. It is a gas at ordinary temps., condensing at -21°C . It rapidly decomposes to form meta-formaldehyde, a crystalline compound. When the metaformaldehyde is heated F. is again formed, which decomposes once more on cooling. When the aqueous solution of F. is evaporated, the F. is converted into paraformaldehyde, an amorphous substance. All three substances have the same percentage composition, so that they form an example of polymerisation. F. occurs in the chloro-

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Formic

phyll cells of plants, and is an effective germicide. **Formalin** is a trade product, consisting of an aqueous solution containing about 40 per cent of F.; it is much used as an antiseptic. F. reacts with ammonia to form a white solid, hexamine, which, when treated with concentrated nitric acid yields cyclonite ($\text{C}_2\text{H}_5\text{N}_3\text{NO}_2$). Cyclonite (R.D.X.) was a prin. ingredient in the under-water explosive used against U-boats in the Second World War. With phenol (q.v.) F. reacts to form the well-known and extensively used plastic bakelite. F. is used in tanning leather, in the dye industry, and in the synthesis of many drugs.

Formalin. Solution obtained from formaldehyde (q.v.) which has great powers of doodorisng and preserving various substances. The former fact makes it a particularly unsuitable medium for preserving foodstuffs, where the odour is often the chief check the consumer has upon the good or bad quality of an article; none the less it is largely used on the Continent for this purpose. F. is used in many industries because of its chemical effect upon soft substances, and is also of value in some important secret processes. It is also a powerful antiseptic and disinfectant.

Formalism (in philosophy). According to Kant those qualities and determinants which fix the arrangement of matter, and thus invest a thing with identity. F. becomes a kind of enhanced idealism. Aristotle says that in organisms an individual has two aspects: matter, out of which he is emerging, and form, into which he is passing. Thus everything is matter, and the potentialities of the individual thing which impel it to its reality are its form. The form is therefore imminent. In reason, matter corresponds to the passive reason, while form is the active reason. In art, form is the third of the four causes, material, efficient, formal, and final. Advanced F. actually denies the existence of matter and recognises form only.

In religion F. stands for excessive devotion to formal precedence and observance, as distinct from the spirit.

Forma Pauperis, see IN FORMA PAUPERIS.

Formia, city, situated in the S. of Italy in the prov. of Caserta and on the gulf of Gaeta; its original name being Mola di Gaeta. It was an old Rom. tn., its name then being Formiae, and it still contains the remains of villas formerly inhabited by Rom. nobles including Cicero. It was also famous for its wines. The best objects of the museum were taken to Naples for safety during the fighting of 1943, but only to be destroyed there. The church of St. Dominic suffered great damage, and that of St. Teresa was practically destroyed. Pop. 8500.

Formic Acid, fatty acid, being a derivative of methyl alcohol or formaldehyde. It is a colourless liquid of specific gravity 1.24; it solidifies at low temps., melting at 8°C . and boiling at 101°C . It has a powerful irritating odour, and blisters the skin on contact. It occurs in

nature in nettles, ants, and other stinging creatures, and owes its name to the ant (*formica*), whose irritating sting is due to the secretion of F. A. The molecular formula of F. A. is CH_2O_2 , and the substance may be prepared by heating oxalic acid with glycerin. The salts of F. A. are termed formates and may be prepared by neutralising the acid with the appropriate alkalis, hydrates, etc.

Formic Ether, or Ethyl Formate, ester of formic acid. It may be prepared by treating formic anhydride with alcohol. Its formula is $\text{H.CO.C}_2\text{H}_5$; it is a colourless liquid with a pleasant peach-like odour, boiling at 55° C. Like many of the esters of organic acids, it is used as a perfuming and flavouring agent in the preparation of sweets, etc. It is also used as an ingredient of a kind of rum.

Formidable, name of a Brit. battleship. It was torpedoed and sunk by the Gers. on Jan. 1, 1915. The present F. is an aircraft carrier of 23,000 tons displacement, completed in 1940.

Formosa, or Taiwan, large and important is. of the W. Pacific, which, until 1895, formed part of the Chinese empire when it came into the possession of the Jap., who held it until 1945. The story of F. furnishes an insight into Jap. methods, defiance, and stubbornness against odds. The indifference of the Chinese to an is. so close to their shores may seem surprising, especially since they were there first, following the influx of 100,000 refugees from the Manchus three centuries ago. But Japan went in, and in place of shabby, sprawling insanitary huts there appeared roads, railways, hotels, and other amenities of civilisation. When it came to subduing savage head-hunters, who for centuries denied the hinterland (and later the camphor forests) to all comers, then Japan proved equal to the task by savagery, or even by electrified fences and other devices borrowed from W. peoples. Although there were at first many endeavours to form a republic, the Jap. rule was later accepted without demur, and the area became peaceful. After the Second World War F. was constituted a prov. of the republic of China.

The is. is 225 m. long, and from 60 to 80 m. broad, and is about the same size as Kiusiu, one of the four chief is. forming Japan proper. F. is regarded by some as a link in the chain of volcanic is. which form the E. escarpment of a former Malayo-Chinese continent. The backbone of the is., extending N. and S., is formed of a range of densely wooded mts., of which the highest peak is Mt. Morrison (14,720 ft.), and the second Mt. Sylvia (12,480 ft.). E. of this the country is mountainous, terminating in a precipitous coast and a few rocky islets. The W. coast presents a remarkable contrast to the bold rocky face of the E., which contains the highest known sea cliffs in the world (3000 ft.). It consists of a broad, alluvial plain seamed by a number of water channels, and terminating at the coast-line in sandbanks. The land on this side is regularly gaining on the sea, prob-

ably owing to the sediment brought down from the mts. by water-courses during the rainy season. The climate is damp, hot, and malarious, and on the whole very trying to many people. The driest and best months in the N. are Oct., Nov., and Dec. Violent typhoons are very common at certain seasons in the sea immediately S. of F. The is. is famous for the rich luxuriance of its vegetation. Orchids and other ornamental plants of F. enrich our European greenhouses. There is also a profusion of ferns, fern-trees, camphor, bamboos, pines, palms, and banana trees. The pineapple, too, grows in abundance. Of animal life, there are at least three kinds of deer, wild boars, monkeys, flying squirrels, and at least forty-three species of birds peculiar to the is. Noxious wild animals are few. Little is known of the geology of the is. Gold is obtained in the Kolung dist., and bituminous coal and sulphur abound. Petroleum and natural gas are also found, but are undeveloped. The chief industry is agriculture, carried on by the Chinese settlers; tea and sugar are the staple products. It is the prin. source of the world's camphor supply. Other products are rice, fruits, indigo, opium, and tobacco. Area 13,886 sq. m. The pop. is estimated to number 5,212,000. The pop. of the cap., Taihoku (Taipei) is 230,000. See R. Goldschmidt, *Neu-Japan, Reisebilder aus Formosa*, 1927; and A. J. Grajdancev, *Formosa To-day*, 1942.

Formosa: 1. Ter. in the Argentine Republic, S. America, in the extreme N. It lies between the Rrs. Pilcomayo and Bermejo. The estimated area is 29,143 sq. m.; pop. 112,000. This ter. forms part of the great Chaco plain. Not very much is known about the region, except that it is covered with forests and in large sections liable to inundations; the summer rains lasting from Oct. to May. 2. F. is the chief tn., situated on the Paraguay R. It was founded after the defeat of the natives of Chaco by Gen. Victoria in 1884-85. Pop. 16,000.

Formula, chem., a collection of symbols which indicates the composition and certain other characteristics of a substance. Each element is represented by a letter or two letters derived from the Eng. or Lat. name; thus O is an abbreviated form of oxygen, Hg stands for mercury (Lat. *hydrargyrum*). But the symbol not only stands for the name of the element, it also represents a definite relative weight. This weight is known as the atomic weight of the element, and it indicates the smallest quantity of the element that is known to enter into chemical composition, measured in terms of the atomic weight of hydrogen as unit. When two or more symbols are placed in juxtaposition, the resulting F. indicates that the elements are in chemical combination in the proportions shown by their atomic weights. Thus H_2O represents water, and indicates that 2 parts by weight of hydrogen are united to 16 parts of oxygen, 16 being approximately the atomic weight of oxygen. A figure placed to the left of a F. applies to the F. as a

Formula

whole. Thus, in the equation $3\text{NO}_2 + \text{H}_2\text{O} = 2\text{HNO}_3 + \text{NO}$, we have indicated the fact that 138 parts of nitrogen peroxide react with 18 parts of water to produce 126 parts of nitric acid and 30 parts of nitric oxide. In the formula NO_2 , N stands for 14 parts by weight of nitrogen and O for 16 parts of oxygen; NO_2 therefore represents 46 units of weight, while 3NO_2 means three times that quantity. A F. which simply indicates the respective proportions of the elements is called an *empirical F.* Thus H_2O and H_2O_2 might both serve as empirical formulas for water, as they represent the same ratio of the weights of hydrogen and oxygen when H is understood to indicate 1 unit and O 16 units of weight. In every quantity of the same chemical compound the constituent elements are in an invariable ratio. The smallest portion of matter that can exist by itself is called a molecule, and in the molecule of a compound the same invariable ratio of the quantities of the elements is maintained. Each element of the compound is present in every molecule in the form of one or more atoms, and it is desirable that the F. of a substance should represent the actual numbers of the atoms of each element in the molecule. Such a F. is called a *molecular F.*, and in order to obtain it the molecular weight of the substance must be found. The estimation of molecular weight is based on the hypothesis of Avogadro, who suggested that equal volumes of all gases at the same temp. and pressure contain the same number of molecules. By finding the density of a gas, that is, the ratio of its weight to the weight of an equal volume of hydrogen under the same conditions of pressure and temp., we find also the ratio of the weight of a molecule of the gas to that of a molecule of hydrogen. As other considerations have led to the conclusion that a molecule of hydrogen contains two atoms, it follows that the molecular weight of a substance is twice its vapour density. The importance of molecular weight in this connection is seen from the following example. Formaldehyde, acetic acid, and lactic acid have the same empirical formula CH_2O . The molecular weight of formaldehyde is 30, that of acetic acid 60, and that of lactic acid 90. Assuming from other evidence that the atomic weight of carbon is 12 and that of oxygen 16, it follows that the number of atoms in the molecule must be represented as CH_2O for formaldehyde, $\text{C}_2\text{H}_4\text{O}_2$ for acetic acid, and $\text{C}_3\text{H}_6\text{O}_3$ for lactic acid. Among organic compounds there are many cases of different substances with the same molecular F., but with different physical and chemical characteristics. This is explained by assuming a difference of structure or arrangement of the atoms in the molecule, and another form of F. is necessary. The disposition of the atoms in a molecule of ethyl alcohol is thus indicated:



Forrest

Forrest

is called a *graphic F.*, and shows that one carbon atom is directly united with three hydrogen atoms, the second carbon atom with two hydrogen atoms, and the oxygen atom with one hydrogen atom. This linking of atoms agrees with the behaviour of organic substances, as in chemical action the atoms tend to be replaced in groups. The same information is conveyed by the more concise *structural* or *constitutional formula*, $\text{CH}_3\text{CH}_2\text{OH}$. In electronic F.s, crosses, circles, and dots are used as well as the literal symbols, to indicate the various types of electrical bonds assumed to be holding the atoms together: thus the formula H_2Cl : indicates that in the molecule of hydrogen chloride the hydrogen and chlorine are bound by a link consisting of one electron (\times) from the hydrogen and one from the chlorine.

Foro Appio, see FORUM APPII.

Forres, royal burgh of Moray, Scotland. Close to this tn. on Chuny Hill is built a hydropathic estab. There is also a tower erected in honour of Nelson, and an anct. obelisk. Pop. 4400.

Forrest, Edwin (1806-72), Amer. tragedian b. in Philadelphia, of Scottish and Ger. descent. He made his first public appearance in 1820 in Philadelphia in the part of Douglas in Home's tragedy of that name. He crossed to England in 1836 and entered on a season at Drury Lane Theatre, London, where he achieved distinction in the Shakespearian roles of Macbeth, Lear, Othello, and Richard III. He finally returned to the New York stage, and his last appearance was in 1871. See J. Lee, *Life of Edwin Forrest*, 1838; and L. Barrett, *Edwin Forrest*, 1881.

Forrest, John, first Baron Forrest of Bunbury (1817-1919). Australian explorer and statesman, son of Wm. F. Educated at Perth, W. Australia. At the age of twenty-two, after four years' service in the State survey dept., he was sent in charge of an expedition to seek for traces of the lost explorer Leichhardt. Five years later he explored the colony of W. Australia from Champion Bay to Port Darwin, being awarded for this and his other journeys the gold medal of the Royal Geographical Society and other honours, together with a large grant of colonial land. On the attainment by W. Australia of responsible government, for which the colony was largely indebted to his exertions, he became its first Prime Minister, and held office for over ten years. In his term as Premier important gold discoveries were made in W. Australia, and it was to his vision and determination that the colony owed the Fremantle harbour works, the projection of railroads to the mining dists., the goldfields water scheme and its excellent land laws. He held many ministerial posts in the federal Parliament, including those of treasurer and acting Prime Minister. He pub. *Explorations in Australia* (1876). See H. G. Turner, *First Decade of the Australian Commonwealth*, 1911.

Forrest, Nathan Bedford (1821-77), soldier, was b. near Chapel Hill, Tennessee.

On joining the Confederate army after the beginning of civil war in America, he became a commander of the cavalry and did some distinguished service for his country. Military men rank him as one of the greatest of natural cavalry leaders. In the campaign of 1862 he made a dash across the state of Tennessee and for two weeks cut Gen. Grant off from communication with the world and seriously delayed the advance on Vicksburg.

Forrestal, James Vincent (1892-1949), Amer. statesman, b. in Beacon, Dutchess co., New York. Went to local schools, and then worked as a newspaper reporter; but later went to Dartmouth College, and Princeton Univ. Sold bonds for the banking house of Dillon, Read and Company. In 1918 he served in the office of naval operations, in the Navy Dept., Washington, and subsequently as a naval aviator. After the war he returned to his banking house, becoming its president in 1937. Nominated by President Roosevelt to be under-secretary of the navy—a newly-created post, entailing responsibility for all material provided for the navy. Acting-secretary of the navy 1944; secretary a month later. F. was the driving force behind an immense production of ships, planes, guns, and other munitions of war, besides establishing close relations with Britain in solving problems connected with the Lend-Lease Act. In 1947 he was appointed first U.S. Secretary of Defence. Resigned (for health reasons) 1949, being awarded the Distinguished Service Medal, the highest honour given to civilians in the U.S.A.

Forskål, Peter (?1736-63), Swedish botanist. In 1761 he was chosen by the king of Denmark to join the scientific expedition to Arabia, and here he collected several hundred plants, previously unknown, and pub. a "Flora" at Malta. He d. on his return journey from Arabia, having contracted the plague. His papers, etc., were pub. by Niebuhr under the titles: *Descriptiones Animalium, Arrium, Amphoriorum, Iiscium, Insectorum quae in Itinere Orientale obseruavit P. Forskål*, 1775; *Flora Aegyptiaco-Arabica*, 1775, etc. The genus *Forskalia* is called after him.

Först, in. of Brandenburg, Germany, E. of Cottbus, on the R. Neisse. It is noted chiefly for the manuf. of woollen cloths. Pop. 15,000.

Forster, Edward Morgan, Eng. novelist and essayist, b. in London, Jan. 1, 1879, of Anglo-Irish extraction on his father's side. He was educated at Tonbridge School where he was a day-boy, and at King's College, Cambridge, where he took his degree in classics and hist. in 1901. He became a fellow of King's in 1927. At Cambridge he made a lifelong friendship with Lowes Dickinson, who with F., Nathaniel Weid, his classics tutor, G. M. Trevelyan, and others founded the *Independent Review*. F.'s first novel *Where Angels Fear to Tread* (1905) was written at the age of twenty-six while F. was living in Italy. It was followed by others in quick succession, *The Longest Journey* (1907), *A Room with a View* (1908), and *Howards End* (1910). These project an

exquisite and animated crowd of beings—delicious elderly ladies, priggish or tormented or cheerfully barbarian young men, perceptive or conventional young women, beautifully of their period and class; and all set in the silver-point world of their creator's civilised irony' (Rose Macaulay). *The Celestial Omnibus*, a collection of short stories, appeared in 1911. The last of his novels, and the best known, *A Passage to India*, was begun shortly afterwards, but not completed and pub. until the year 1924. All F.'s novels have in common a preoccupation with personal relationships and the difficulty, or rather impossibility, of harmonising opposing conceptions of life. Two worlds are sharply opposed in one of his best novels, *Howards End*, in which one of the characters Helen Schlegel says: 'Personal relations are the important thing for ever and ever, and not this outer world of telegrams and anger.' In his novels the people of the outer world of convention and formality, hidebound, not lacking in intelligence but failing a real sense of human values, are constantly thrown up against situations where they are powerless whereas the apparently ineffective characters are revealed to have some quality of personal power springing from their sense of a real and inner truth. In spite of personal failures and misjudgments they are better equipped to deal with emotional stress and crisis. In this connection the construction of plot is important in F.'s hands, and he relies at times on situations of extreme violence to test the qualities of his characters. *A Passage to India* (later pub. in Everyman's Library with the addition of F.'s own notes) gained him a wide reputation for the insight and wisdom with which he depicted the relations between the Indians and the Eng. in India. There are many striking passages in his books, while, as a satirist dealing with conventions, he is both penetrating and mordant. Again, as in the novels of Hardy, there is a subtle and often bitter irony in the situations in which his characters find themselves impotently struggling against the monstrous effects which have sprung from the most trifling causes. Sometimes, indeed, the conviction persists that the characters are prisoners of their creator's ingenuity, unable to escape into the real world. The integrity with which F. approached life in his novels has also enhanced the value of his miscellaneous and critical writings. *Aspects of the Novel* was delivered first as the Clark lectures at Cambridge in 1927 and pub. in the same year. A vol. of short stories *The Eternal Moment* appeared the following year and included stories such as *The Story of the Siren* which were written much earlier. Other books include *What I Believe* (1939), *Nordic Twilight* (1940) and the Rede lecture on Virginia Woolf, pub. in 1942. Contributions to Eng. periodicals in the twenties were collected and pub. under the title *Abinger Harvest* (1926). See Rose Macaulay *The Writings of E. M. Forster*, 1938; I. Trilling, *E. M. Forster*, 1944. Studies of F. also appear in B. Dobree's *The*

Lamp and the Lute, 1929; Virginia Woolf's *The Death of a Moth*, 1929; Katherine Mansfield's *Korels and Novelists*, 1930; C. Connolly's *Enemies of Promise*, 1938; and Lord D. Cecil's *Poets and Story-Tellers*, 1949.

Förster, Friedrich Christoph (1791-1868), Ger. historian and poet, and brother of the painter Ernst Joachim F., b. at Münchendorf. He first devoted himself to the study of archaeology and the hist. of art, but on the outbreak of the War of Liberation, in 1813, joined the army, where he quickly attained to the rank of captain, and by his fiery war-songs stirred up his countrymen against the Fr. On his return to Berlin, he taught in the school of artillery and engineering for a short time, and in 1829 became custodian of the Royal Art Museum with the title of court councillor. F. was connected with various journals and was the founder and secretary of the *Wissenschaftlicher Kunstverein* in Berlin. His prin. works are *Der Feldmarschall Blücher und seine Umgebungen*, (1821); *Friedrichs des Grossens Jugendjahre, Bildung und Geist* (1822); *Albrecht von Wallenstein* (1834); and *Wallensteins Prozess* (1844). He also wrote poems and a drama, *Gustav Adolf* (1833), and adapted sev. of Shakespeare's plays for the theatre.

Forster, Hugh Oakley Arnold, see ARNOLD-FORSTER, HUGH OAKLEY.

Forster, Johann Georg Adam (1751-94), eldest son of Johann Reinhold F., b. at Nassenhuben near Danzig. At the early age of seventeen he accompanied his father on Cook's second voyage, and pub. an account of the expedition. He was for sev. years prof. of natural hist. at Cassel and Wilno (Vilna) respectively, and then became librarian to the elector of Mainz in 1788. His writings, of which the most important are *Ansichten von Niederrhein* (1791-94) and *Beschreibung einer Reise um die Welt* (1784), rank high amongst Ger. works descriptive of nature. His Letters were pub. by his widow in 1829 (2 vols.). See J. Moltschott, *G. Forster, der Naturforscher des Volks*, 1874; A. Leitzmann, *Georg Forster*, 1893; and P. Zincke, *Georg Forsters Bildhund Wunderl Zeiten*, 1925.

Forster, John (1812-76), biographer, b. at Newcastle; educated at the grammar school there, and at Univ. College, London. Became a barrister of the Inner Temple, but soon gave up law for literature, having indeed, at an early age become contributor to the newspapers and reviews. At the age of twenty he was appointed dramatic critic to the *True Sun*, and two years later ed. the short-lived *Reflector*, to which his friends Lamb and Leigh Hunt contributed. During this period he did much journalistic work, but his ambition was to write books, and between 1836 and 1839 he wrote the *Lives of the Statesmen of the Commonwealth*. In 1846 he was for a few months ed. of the *Daily News* in succession to Dickens, and in the next year he became ed. of the *Examiner*. His admirable *Life and Adventures of Oliver Goldsmith* appeared in 1848. Being appointed in 1855 secretary to the Commissioners of Lunacy, he at once gave up

journalism, and devoted himself to more serious labours. Among his close friends were Carlyle, Dickens, and Landor. His best known work is his biography of Dickens (1872-74), which, in spite of many defects, still ranks as the standard authority. He also wrote lives of Landor (1868), Sir John Elliot, and the first vol. of a life of Swift. See P. H. Fitzgerald, *John Forster, by one of his Friends*, 1903; and R. Renton, *John Forster and his Friendships*, 1912.

Forster, William Edward (1818-86), b. at Bradpole, Dorset, was of Quaker ancestry, and remained a member of the Society of Friends until his marriage in 1850 with a daughter of Dr. Arnold. He was brought up to go into business, and in 1842 became a partner in a firm of woollen manufacturers that, after overcoming initial difficulties, became a very prosperous concern. He became Liberal member for Bradford in 1861, and held the seat until his death. He made his mark in Parliament early, and in 1865 was appointed under-secretary for the colonies. He became vice-president of the Council three years later, and was given charge of various Bills, which he piloted successfully through the House. Upon Gladstone's return to power, in 1880, he became chief secretary for Ireland. He made an earnest effort to cope with the Irish problem, but, losing the support of his colleagues over the imprisonment of Parnell and other Land League leaders, he resigned. There is a biography by Sir T. Wenysse Icld (1888).

Forsyth, Alexander John (1768-1843), inventor, b. in Aberdeenshire. After the death of his father he became the minister of Belhelvie, Aberdeenshire, and about the year 1806 invented the percussion lock, which secret Napoleon offered to buy for £20,000, but was refused. See Sir A. J. Forsyth Reid, *The Rev. Alexander J. Forsyth and his Invention of the Percussion Lock*, 1909.

Forsyth, Andrew Russell (1858-1942), Brit. mathematician; b. at Glasgow; son of John F. Educated at Liverpool College and Trinity College, Cambridge. He became prof. of mathematics at Univ. College, Liverpool, 1882-83, and Sadlerian prof. of pure mathematics at Cambridge, 1893-1910. Chief prof. mathematics, Imperial College of Science and Technology, S. Kensington, 1913-23. F.'s chief work was *Theory of Differential Equations* (1890-1906). He also pub. *Intrinsic Geometry of Ideal Space* (1935).

Forsythia, or Golden Bell. Deciduous shrub of the family Oleaceae blooming very early in advance of the leaves, and with yellow flowers. Two well-known species from China are *suspensa* and *virgissima*, and popular varieties are *atropurpurea*, *Fortunei*, *Sieboldii*, *intermedia*, and *spectabilis*. Plants are all 6 to 8 ft. in height.

Fort, see FORTIFICATION.

Fortaleza, also called Ceará, the cap. of the state of C. in Brazil. It is a seaport, being situated on a bay, though vessels cannot anchor very far into the harbour. The tn. itself is well arranged, and is connected by rail with the interior

regions of the country, which are much more fertile than its environs. It trades principally in coffee, sugar, rubber, and drugs. Pop. 143,200.

Fort Atkinson, city of Wisconsin, U.S.A., lies on the Rock R., 55 m. S.W. of Milwaukee. Situated in an agric. locality, its industries consist of the manuf. of harrows and dairy machinery, chairs, sleighs, and carriages. It has also knitting mills and meat-packing estabs. It received its name from a fortification erected there, in 1836, by Gen. Atkinson during the Black Hawk war. Pop. 6,100.

Fort Augustus, vil. on the Caledonian canal at the head of Loch Ness, 33 m. S.W. of Inverness. It was built in 1716, under the name of Kilchumin, and captured by the Jacobites in 1745. After the battle of Culloden it was reoccupied and received its present name in honour of Wm. Augustus, duke of Cumberland, the victorious general. It was then used as a sanatorium till 1857, and in 1876 was presented to the King, order of Benevolence, and converted into a stately abbey, college, and hospice. Pop. 6,100.

Fort Beaufort, dist. in the S.E. of the prov. of the Cape of Good Hope. Its cap. is F. B., which lies 45 m. W. by N. of King William's Tn. Pop. of dist. 20,000.

Fort Bilov; *see Morile*.

Fort Collins, cap. of Larimer co., Colorado, U.S.A., 74 m. N. of Denver, on the Colorado and S. railroad. The state agric. college was opened here in 1879. The city is the centre of a fertile region and has an extensive system of irrigation. Pop. 12,200.

Fort Dodge, cap. city of Webster co., Iowa, U.S.A., and is situated on the Des Moines R., and on sev. railroads. Has coalfields, quarries of building stone, and manuf. of pottery, plaster, stucco, and foundry products. Pop. 22,500.

Fort Edward, vil. in the co. of Washington, New York, U.S.A. It stands on the Hudson R., and on the Delaware and Hudson railroad to the N. of Troy. It has iron and brass works, also paper mills and potteries. Pop. 4,000.

Fortescue, Adrian (1874-1923), Eng. Catholic priest, scholar, orator, and artist. Son of former provost of St. Ninian's, Perth, who was received into the Catholic Church. Educated at Jesuit preparatory school, Boulogne; St. Charles College, Bayswater; Scots College, Rome; Innsbruck Univ. An exceptional linguist, studied Hungarian, Arabic, Syriac, Russian, as well as the more regular Hebrew, Greek, Italian, German, and French. At Innsbruck, prescribed for himself in due course Sanskrit, Icelandic, and Old English—"If God spares me." A vivid and powerful personality, as interested in action as in literature, he wrote and drew standing at his desk. Fought at least twice for his life, with fanatics or brigands in E. Europe. Held pastoral posts at Ger. Church, Whitechapel, 1899; Chipping Ongar, Colchester, Enfield, Witham, and Maldon. In 1907 appointed to the charge of the Catholic community at the new garden city, Letchworth, which he held for his last sixteen years. F. lec-

tured, talked, and debated with startling ease, force, and charm on a wide variety of linguistic and scholarly subjects. Among the polychromatic series of his lectures were such as *Philosophy of St. Thomas*; *Science and Faith*; *The Alphabet*; *Organisation of the Church in First Three Centuries*; *Mormons in Utah*; *Religion and Politics in Balkans*; *Christianity and War*; *The Italo-Greeks*; *The Slavs*; *Socrates*; *The Uniate Churches*; *Boethius*; *Essence of the Catholic Religion*; *Life of Dante*; *Learning Languages*; *Charles III. (Young Pretender)*; *Christianity in Rom. Empire before Constantine*; *Religion and Philosophy in the Rom. Empire*; *Dante*; *Christ and Plato*; *Austria-Hungary*; *Turkey*; *Death of the Gods*. Ease and verve in him were never superficial, and in every study he went deep. Preached his last sermon on 'Christ our Friend and Comforter,' Letchworth, Dec. 31, 1922, before going for surgical operations in London; d. Feb. 11, 1923. Among his many pub. works are books on the Gk. Fathers and the Orthodox E. Church; *Liturgy of St. John Chrysostom* (1908); *Preface to Thomas à Kempis' De Imitatione Christi* (1919) and *Roman Missal* (1920). *The Mass* (1920); *The Ceremonies of the Roman Rite*, with designs by the author (1920); *Histoire des Patriarches d'Alexandrie* (par Jean Maspero), r^evu par A. Fortescue and G. Wiel (1923). Pamphlets: *How to Pronounce Latin* (1908); *Pope Gregory VII.* (1909); *The Branch Theory* (1910); *The Vestments of the Roman Rite* (1912); *Formula of Hormisdas* (1914); *Russia and the Catholic Church* (1915); *Pacifism* (1916); *Date of Anglican Schism* (1917); *Catholic because Roman Catholic* (1917). See *Adrian Fortescue*, memoir by J. G. Vance and J. W. Fortescue, illustrated with his illuminated penwork, 1924, and R. L. Hine, *Confessions of an Un-common Attorney*, 1946.

Fortescue, Sir John (c. 1394-c. 1476), b. in Somersetshire and educated at Oxford. He was three times appointed governor of Lincoln's Inn during Henry VI.'s reign, and in 1442 was chief justice of the king's bench, being highly recommended for his wisdom, gravity, and uprightness. He was a great favourite with Henry VI. and held office during the remainder of his reign, faithfully serving and steadily adhering to him. At the accession of Edward IV., F. was charged with high treason, and accompanied Queen Margaret and her court in their exile to Holland. He afterwards returned to England and received a pardon from Edward IV. on the defeat of the Lancastrian party. F.'s fame rests on his work, *De laudibus legum Angliae*, written c. 1470 (printed 1537), written during wanderings abroad for the instruction of the young Prince Edward, and on *On the Government of the Kingdom of England*, not printed until 1714. See *Lord Clermont, History of the Family of Fortescue*, 1869.

Fortescue, Sir John William (1859-1933), Brit. military historian, a son of the third Earl Fortescue. Librarian at Windsor Castle, 1905-26. Author of

History of the British Army (1890-1920), a monumental work in many vols. Other pubs: *History of the 17th Lancers* (1895); *Wellington* (1925).

Forteventura, see FUERTE VENTURA.

Forteviot, vil. of Scotland, situated in the co. of Perthshire. It stands on the R. Earn to the S.W. of Perth. The old tn. of that name, which was close by, was the cap. of the Picts and Scots. Pop. 600.

Fort Garry, see WINNIPEG.

Fort George, fortress in the co. of Inverness, Scotland. It is situated at the mouth of the Moray Firth.

Forth, Scottish riv., formed by the

of 100 tons up to Stirling, and for vessels of 300 tons to Alloa. Grangemouth on the F. is connected with Bowling on the Clyde by the F. and Clyde Canal, about 38 m. long, on which Symington tried his first steamer in 1801-2. It is proposed to construct a new canal for large ocean-going vessels. The firth is a bay-like extension of the riv., about 50 m. long, with an average breadth of $2\frac{1}{2}$ m. (as much as 17 m. wide at Prestonpans). At Queensferry it is only 1 m. across, and is spanned by a cantilever railway bridge, 8295 ft. long, with two main spans of 1710 ft. each, built between 1882 and 1890.



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THE FORTH BRIDGE FROM SOUTH QUEENSFERRY

union of two headstreams, the Duchray Water and the Avondhu, which drains Lochs Chon and Ard. Rising on the N.E. side of Ben Lomond, the F. flows E., joining the Laggan or Avondhu (Perthshire) just above Aberfoyle. The 124 m. between Stirling and Alloa are known as the 'Links of F.', from the many picturesque windings. The riv. then expands into the arm of the North Sea called the firth of F. (Bodotria, Boderia, Estuarium, Scots Water). The riv. is about 107 m. long, reaching Stirling after a picturesque course of 39 m., instead of a direct one of 18 m. Its chief trib. are the Teith, draining Lochs Katrine, Achray, Vennachar, and Lubnaig (by means of the Leny), the Allan Water, and the Devon. The riv. and, lower, the firth, divide the shires of Perth, Clackmannan, and Fife on the N. from Stirling, W. Lothian, Midlothian, and E. Lothian on the S. The riv. is navigable for vessels

The firth is from 3 to 37 fathoms deep, and has good harbours, St. Margaret's Hope being one of the safest Scottish roadsteads. Rosyth, near by, became a naval base in 1903. The Bass Rock and the Isle of May are at the entrance to the firth, which encloses the is. of Inchcolm (with a ruined monastery), Cramond, and Inchkeith (with a lighthouse, as has also the Isle of May). The chief rivs. flowing into the firth are the Carron, Avon, Almond, Water of Leith, Esk, and Leven. Its chief port is Leith, the port of Edinburgh. Others are Granton, Ho'ness, Grangemouth, and Kirkcaldy. Salmon and herring fisheries are carried on in the F.'s basin, and white fish abound. There are vast deposits of coal beneath the bed of the firth, already worked by the Fife collieries. There are various places of historical interest on the riv.'s banks, amongst them Stirling (once a royal residence), Cambuskenneth, Alloa, Kincar-

dine, and Aberfoyle, Falkirk, near by, has the remains of the wall of Antoninus, and Carberry Hill and Loch Leven, noted in the hist. of Mary Queen of Scots, are not far distant. Bede (d. 735) called the firth *Sinus orientalis*; to Nennius (fl. 796) it was the *Mare Friesicum*. Consult Dick *The Pageant of the Forth*, 1910.

Fort Hamilton, vil. of Kings co., New York, situated on Long Is. The fort serves as a defence of New York.

Forth and Clyde Canal, canal 40 m. in length by means of which the R. Forth communicates with the Clyde. It extends from Grangemouth on the E., to Bowling, Dumbartonshire, on the W., and divides the country at its narrowest part. It was completed in 1791. It is not used regularly by any great volume of traffic.

Fortification, 'the art or science of fortifying places in order to defend them against an enemy.' F. may definitely be divided into three parts: First, permanent F.s. which are being continually built in time of peace to defend some vulnerable point in the defences of a country. Much time and labour are given to this, as, especially on the Continent, the permanent F.s. form a very essential part of the country's defences. Secondly, semi-permanent F.s., such, for example, as are erected when war seems to be imminent and care is being taken to see that all points of the defence are made secure. Thirdly, field F.s., e.g. such military works as are constructed by military engineers during a campaign which have no real permanence and which are only of value during the campaign itself. Such works are built to strengthen the position taken up by an army and to provide as many obstacles as possible to the attacks of the enemy. Field F.s. reached an extraordinary pitch of development in the First World War (see e.g. HINDENBURG LINE; HOHENZOLLENN REDOUTE).

During the early stages of the world's hist. defence was stronger than attack. The main weapons of attack were the battering-ram and the catapult. This latter weapon usually hurled huge stones at the walls of the place attacked. Obviously then the best means of defence against attacks of this kind was the building of huge walls. These, which often attained a thickness of 30 to 40 ft., were practically impregnable, and to this fact the baron owed a great deal of his baronial power. It was obviously impossible for the king to take the castles save by a long siege, and the time expended on such a proceeding was not sufficiently compensated for by the result. The great curtain wall of the castles was commanded by huge towers at each corner, which prevented the enemy from easily attacking the walls, since they could be met by a front and flank defence. Up to the time of the Renaissance the castle may be regarded as the chief method of F. The invention of gunpowder did not immediately bring with it the abolition of the castle. At first the difficulties of firing and the bad ammunition used (usually stone balls) caused little or no damage to the fortified places, but with

the invention and customary use of cast-iron cannon balls, the superiority of the fortified places over the army of attack came to an end. The classic example is the rapid success of Charles VIII. of France during his attack upon the fortified places of Italy. Before his artillery these places fell rapidly, and new means had to be adopted to prevent the enormous damage done by the artillery fire. Mounds of earth began to replace the towering walls of the forts, and these mounds were protected by means of wide deep ditches. The depth was usually 20 to 30 ft., and the ditches were strengthened with masonry (revetments). The face of the castle also began to alter, and the sixteenth century saw the erection of great bastioned fortresses. The enemy naturally massed their artillery together when besieging a fortress in order the more easily to breach the curtain wall.

The bastion (see BASTION) consisted of two faces and two flanks, and a cross fire was able to be poured on to the massed artillery of the enemy from the face of the bastion, whilst at the same time from the flank of the bastion the curtain wall could be easily defended. The enemy could also be attacked by a direct fire from the curtain wall. The attacking army gradually altered its tactics. Instead of attempting to breach the curtain wall, it began to attack the bastion itself. The usual point of attack was the salient angle of the bastion—that is, the angle formed by the meeting of the two faces of the bastion itself. Ravelins or outworks which commanded the position of the attacking artillery were consequently added in order to counter this form of attack, and under the great engineers of the sixteenth and seventeenth centuries, the outworks of the bastions were extended until they became what can best be described as a step-by-step defence, i.e. the garrison resisted to the best of their ability until forced to retire from the outer line, when they fell back on the next line, resisting all the time. The names of famous engineers during this period are legion, but probably the greatest of all names is that of the Fr. engineer, Sébastien le Prestre de Vauban. This great engineer took part in numerous sieges between the years 1667-98, and was eminently successful in his work. He was essentially practical, and although he himself did not believe in systems of F., still it is chiefly by his first, second, and third systems that he is known to posterity. The art of war underwent some considerable modification during the seventeenth and eighteenth centuries, but in no essential feature did it actually change. The sieges of the Napoleonic wars were conducted on almost similar lines to those of Marlborough's campaigns, but with the end of these wars a change was brought about. The range of the artillery was rapidly increasing, the distance from which they were effective had increased to half a mile. It became obvious, therefore, after the Napoleonic wars that the guns of the besiegers must be kept at a greater distance. The enceinte, i.e. the

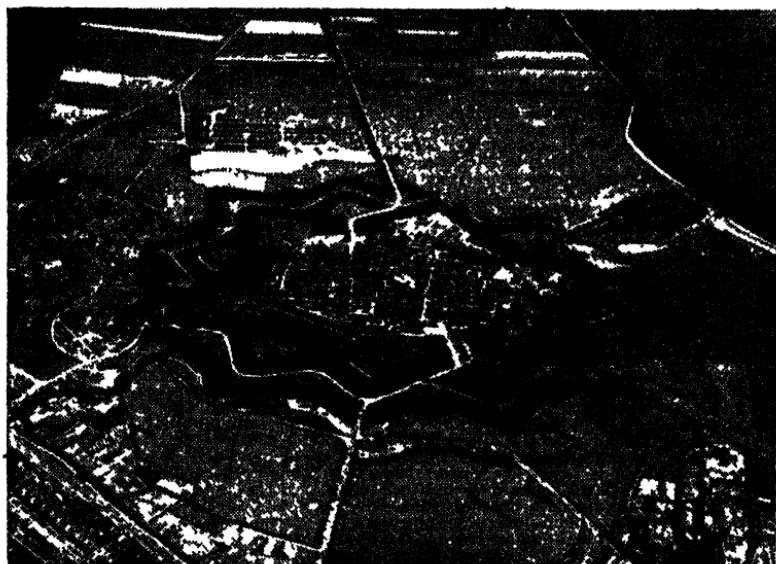
line of F.s. forming the chief works of a fortified place, must be more amply defended. To do this fortresses were built some distance from the enceinte and yet sufficiently close to one another to be able to give support when attacked. Each of these smaller fortresses was self-sufficient, i.e. it was adequately garrisoned and adequately provisioned so that if necessary it could stand a siege by itself. These fortresses were built on much the same plan as was used for the larger fortresses themselves. The introduction of rifled artillery fire caused stonework F.s. which were exposed to artillery to be condemned. The Franco-Prussian war and the siege of Paris proved the uselessness of the fortress defended by bastions. Fortresses were thrown out to prevent the direct attack of the enemy on the enceinte to greater and greater distances. This in itself made it necessary that the besieging army should increase in proportion to the distance to which the protecting fortresses were thrown out, since the zone to be invested by the besieging army had become much greater. The main lines which modern F.s. follow (subject to the lessons taught by the First World War, as to which see *infra*), however, are: That in the first place the girdle of fortresses should be thrown out to such a distance that direct bombardment of the place cannot take place. Secondly, that the guns in the fortresses should be protected by armour, but that the bulk of the defending artillery should be outside the defended fortress. Thirdly, that the defence should depend to a very large extent upon the infantry, and that for this purpose the forts should be connected one to another by means of infantry entrenchments. Fourthly, that the lines of communication should be kept open and well guarded between the main fortress and the girdle of defensive fortresses. The guns outside the fortresses are either to be concealed or protected by means of eupolas, and the entrenchments of the infantry should be made bomb-proof. The great art in defence as well as attack in modern times is concealment, and this has been made much more possible by means of the invention of smokeless powder. Modern F. is rapidly approximating to field F., since, as stated above, the main line of defence is the infantry strongly entrenched in redoubts prepared and made bomb-proof. The strength of a fortified position depends upon its communications, the rapidity with which the defending infantry can co-operate, and the concealment of its guns. The famous Maginot line, extending from the Swiss frontier to Verdun, was pre-eminently a combination of passive obstacle and active defence. Its construction marked the abandonment of the 1914 conception of the offensive *a outrance*, which led to such tragic results in the First World War. Galleries were hollowed out, which, in a straight line, would cover the distance from Paris to Liège, and the whole work cost 7,000,000,000 francs. The towers of the subterranean workings, which weighed 120 tons, were monolithic, and no shell

could penetrate their concrete walls. Defence against gas was assured by a special process. In order to do away with loop-holes, the guns in the turrets pivoted on a ball mounted in the armour plate. Artillery officers saw the outside world through panoramic telescopes built into the armour plate. Telephone lines were buried five metres deep in concrete slabs. The 'zone of fire' was protected by look-out posts, alarm signals, sound-locating posts, and barrages of infra-red rays. The big forts were nothing less than buried barracks with kilometres of passages lit by electricity and provided with metalled tracks. They were habitable for months on end. The Maginot line conformed to the formula of Marshal Pétain (*q.v.*): 'The minimum of danger, the maximum of comfort.' Behind their crenulated embrasures the men of the Maginot line could have literally covered the frontier zone with a sheet of fire through which no infantry could possibly have advanced. That, at all events, was what was claimed for these F.s. Its cardinal defect was that the line was not prolonged to the coast. Its strength for defence was never tested in the operations of 1940, for the Germans broke through the allied lines at Maastricht, and outflanked the line. In the operations of 1944, when the Anglo-American armies advanced on Germany, the enemy was favoured by the advantages accruing from his strong defensive lines, first the Siegfried F.s. (*q.v.*), and behind them the great barrier of the Rhine. The Maginot line, as such, was no integral part of his defence. See further under WESTERN FRONT IN SECOND WORLD WAR.

Field Fortification.—The differences between permanent, semi-permanent, and field F.s. were a century ago very much more strongly marked than they are at the present time. Nowadays no masonry defences are necessary to make a place defensible, and in a short time, with surprisingly little material, very strong F.s. can be made. The elementary field F.s., such as the use of obstacles for defence, have been known practically since the dawn of hist. Trenches, abatis, and stakes have always formed a part of the protective measures of even savage tribes. But the art of field F. has undergone tremendous changes during the last century. Practically up to the present time the great object aimed at by field engineers was to obtain command and to defend by obstacle, nowadays military engineers aim at obtaining concealment and protection. The main points to be noticed in modern field F.s. are that the works erected are adapted to the ground which is being defended. The line of the trenches usually follows the natural line of the hill and valley on which they are erected. Secondly, the erection of elaborate bomb-proof shelters and parapets has been made practically useless, since no military work can be thrown up in a short time which is able to resist the highly explosive shell which is fired nowadays. Thirdly, the most important point of all is to obtain a concealed position. This is an additional reason why parapets

are made nowadays comparatively low, seldom, if ever, exceeding 18 in. in height. Fourthly, although obstacles are still used and created, i.e. wire entanglements, pits, and abatis, these are gradually falling more and more out of use, but they are still of considerable value when stopping the rush of the enemy, and give the defender an opportunity of attacking the enemy while he is labouring under difficulties. Another object of field F. is to give the enemy as little shelter as possible. With this object the ground in front of

Antwerp was carried out on different lines from that of Liège and Namur. Although the Ger. soon demolished the forts they had also to contend with a defensive trench line held jointly by some Belgian forces and the Brit. naval div. along the R. Netha and Rupel. Several attacks were made on the Netha line, but were all repulsed, until the Ger. secured a crossing on Oct. 6. Although the steel and concrete forts and works fell in four days, the trench line held out for six. Maubeuge was similar to Antwerp. Here the com-



K.L.M.

THE FORTIFIED TOWN OF NAARDEN, HOLLAND

Beyond the town, on the right, is the shore of the Ijssel Meer (Zuyder Zee)

the position to be defended is cleared as far as possible to the limits of the range of fire. The outstanding military lesson from the First World War is that it is practically useless to depend on permanent works of defence constructed some years before a campaign, because the continued progress of scientific and industrial development in relation to offensive weapons more than counter-balances the military value of such works. Liège, with its twelve forts in a perimeter of over 30 m., fell within nine days under the pounding of Ger. howitzers of 21 cm., 28 cm., and 42 cm. As the ground between the forts had not been provided with field defences or obstacles, the Ger. infantry were in the city before the forts had fallen. Namur fell in a similar manner, the forts being literally blown to pieces. The Ger. bombardment opened Aug. 20, 1914, and all forts were destroyed by the 25th. The defence of

mander constructed field works well in advance of the permanent works, and although the forts were swiftly destroyed, the field works held the Ger. in check for over a week, a delay which had an important bearing on succeeding events, because it held up 60,000 Ger. troops and deprived von Kluck of facilities for supplying his command in its advance to the Marne. Verdun was mainly a repetition of Maubeuge as regards methods of defence. Confidence was not placed in the great forts, but during the winter of 1914-15 a new defence line was constructed some miles beyond the outer line. This line was eventually forced back to within 4 m. of Verdun, but it covered the most important points. See also VERDUN.

Some of the new features that have affected F.s. are *Aircraft*, which can locate works hidden by rising ground and can bomb at practically any distance in the

theatre of operations; *Artillery*—long-range heavy guns can be made mobile by mounting on railways; *Camouflage* (g.r.) can be used by both sides, i.e. to hide works and also to screen guns.

Concrete 'pill-boxes' were an undoubtedly success in the First World War. They could resist a direct hit by a 6-in. shell and were usually too small and well concealed to be hit by large shells. The use of gas by an attacker can render areas in F.s. virtually ineffective for sev. days, according to the type and quantity of gas used.

Field Fortifications and Tactics in the Second World War.—With the development of tanks and aircraft after 1918 and of deep infiltration as a basic tactical principle, attack, which had been much more costly than defence, became cheaper in lives and material than defence, and, in consequence, fortified posts held by machine-gun fire were overrun by *blitzkrieg* methods. Protection in the Second World War was no longer mainly given by earthworks; it was mainly given by armour and invisibility. In 1918 tanks won a great war; by 1938, with their increased speed and offensive power, they revolutionised warfare and outmoded many former conceptions of F.s. The development of planes was no less decisive. As a flying artillery, planes could do what guns used to do in Napoleon's day—open a breach in the enemy's field F.s. for decisive manoeuvre. The modern tank, combined with swiftly-moved lorry-borne infantry, produced a new type of force, capable of a strategic infiltration, that was the essence of the war by the end of 1941. Motorization gives the blitz attack the power to penetrate almost any linear defences, because it gives the power to concentrate spearhead forces of half a dozen divisions on a mile or two of front. But another form of defence, a non-linear form, was also demonstrated in the Second World War, especially on the Russian front. This is the form known as 'web defence,' of which the basis was the holding, not of consecutive lines, but of ls. or strong points of resistance or 'hedgehogs' capable of all-round defence, capable of continued fighting for long periods after they have been surrounded. This form of defence was learned in the Russian Civil war, in which the rapidly-moving fronts and partisan or guerrilla fighting crystallised around positions defended in isolation, and particularly around tns., vls., and other road centres. These defensive tactics were borrowed from the Ger. methods in the First World War, or system of defence by strong point; but in the Ger. invasion of 1941, the Russians developed the system to a much greater depth of defence and much more reliance on the fortified strong point, with the result that each blitz offensive by the Ger. was less of an actual victory² and more of a stalemate. One of the essential features in any modern system of defence, especially in web defence, is the use in F.s. of an immense number of land-mines. In the Russian and Libyan campaigns both sides used

land mines in quantities never before employed. Indeed the Brit. defences in Libya, like those of Rommel earlier in the campaign, consisted largely of vast mine-fields and Ger. offensive tactics consisted in opening breaches through the mine-fields and forming, with armoured forces, a *kessel* or cauldron, to attack the defending troops in the rear and so widen the gap. The tactics of the phalanx or spearhead of tanks in the blitz attack were shock tactics, since the tanks tried to get to close quarters with the enemy as quickly as possible, using projectile weapons at short ranges; and this was effective against troops deployed in linear positions. But when troops were deployed defensively in fortified tns. and vls., into which the tanks could only penetrate at great risk, and in ls. of resistance or hedgehogs, bristling with weapons in all directions and either naturally tank-proof or made proof against direct tank assault by the use of deep mine-fields, tanks could no longer employ shock tactics in the same way and the pendulum began to swing back from shock towards fire, the tank being armed with an artillery piece equivalent in size to a field gun. During 1942 the *blitzkrieg* won full successes only against obsolete field F.s.; against the modern methods of defence shown in Russia it could only prevail at greatly increased cost. Another method of nullifying F.s. is by the use of airborne troops dropped behind the enemy's defences, the logistic problem being solved in the same way, namely by airborne supplies. In a period dominated by armour and mobility it is impossible for infantry to protect themselves on the battlefield mainly by entrenchment. Their chief protection becomes invisibility, and this is the first reason why the methods and tactics of modern infantry in the Second World War were largely approximated to those of guerrillas; for a guerrilla force is essentially invisible, strikes from the void and retires or scatters to disappear after it has struck its blow. See also ENTRENCHMENT. See Sir G. Clarke, *Fortification*, 1907; H. Plessis and E. Legrand, *Manuel complet de fortification*, 1900; O. Mickische, *Blitzkrieg* (trans.), 1941; and T. Wintringham, *Weapons and Tactics*, 1943.

Fortiguerra, Niccold (pseudonym Carteromaco) (1674–1735). It. poet and bishop, b. at Pistola. His best remembered work is *Il Ricciardetto* (1738), a comic epic, parodying Pulci, Bolando, and Ariosto. See F. Camici, *Notizie della vita et opere di Niccold Fortiguerra*, 1895.

Fortitude Valley, suburb of Brisbane in Queensland, Australia. Pop. about 16,000.

Fort Johnston, station of Brit. Central Africa. It is situated in Nyasaland at the spot where the R. Shire flows from Lake Nyasa.

Fort Lee, bor. of New Jersey, U.S.A., lies on the W. bank of the R. Hudson, opposite the N. part of New York, of which city it is a residential suburb. It received its name in honour of Gen. Charles Lee, being originally a fortification erected by the Amers. early in the War of

Fort Madison

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Independence. Held in 1776 by Gen. Greene, it was abandoned by him on the advance of Lord Cornwallis, and an attempt to recover it in 1780 failed. Pop. 9,400.

Fort Madison, cap. city of Lee co., Iowa, U.S.A. It is situated on the Mississippi R. and on sev. railroads, including the Atchison, Topeka and Santa Fe railway. The state penitentiary is in this tn. It has also iron foundries, paper mills, and machine shops and manufs. farm implements. Pop. 14,000.

'**Fortnightly Review**, The,' Eng. periodical for the expression of political and social views of the philosophical Radicals, estab. in 1855 by George Henry Lewes. Two years later John (Lord) Morley succeeded to the editorship, and till 1882 he continued to direct the periodical. He, in turn, was succeeded by T. H. S. Escott, Frank Harris (q.v.), and Wm. L. Courtney (q.v.), who took over the 'Fortnightly Review' in 1893 and retained the editorship till his death. Became a monthly very early in its career. Since 1934 title changed to 'Fortnightly.'

Fort Panmure, or Rosalie, see NATCHITZ.
Fortrose, bor. of Scotland, situated on Moray Firth, in co. Ross, 10 m. N.E. of Inverness. It consists of two tns., Rosemarkie and Chanonry. There is a good harbour, and it is a summer resort for golf and bathing; there are interesting ruins of a red sandstone cathedral (1460). Pop. 860.

Fort St. George, see MADRAS.

Fort Scott, city of Kansas, U.S.A., and cap. of Bourbon co. It has two foundries and flour mills, and manufs. machinery. Pop. 10,500.

Fort Smith, city of Arkansas, U.S.A., and cap. of Sebastian co.; it is situated on the Arkansas R., 140 m. N.W. by W. of Little Rock, and is served by four lines of railway. It has a good position as a trade centre; the manufs. are chiefly oil, furniture, etc. Pop. 36,500.

Fort Sumter, fort in Charleston harbour, S. Carolina, U.S.A., about 4 m. from Charleston. Here the first Civil war engagement took place in 1861. The Federals under Major Anderson surrendered to the Confederates. In 1865, at the fall of Charleston, the fort was captured and destroyed by the Federal fleet.

Fortuna or **Fortune**, goddess of chance in classical mythology; an It. goddess of great antiquity, extensively worshipped from an early period under a variety of different names. The Gks. called her Tyche, and she was represented on coins as either the giver of prosperity, the controller of destinies, or as indicating the uncertainty of the future. She worked with no reference to law, entirely at her own good pleasure, dispensing joy or sorrow indifferently, unlike the goddess of destiny or fate. F. had temples at Smyrna, Corinth, Elys, Antium, and Praeneste, and in the last one, two statues of her were consulted as oracles. She is generally represented by Gk. sculptors with a rudder, cornucopia, ball, wheel or wings, as her distinctive symbols. See W. Roscher, *Mythological Lexicon*

1889-1902; and G. Wissowa, *Religion und Kultur der Römer*, 1912.

Fortunate Isles: 1. Another name for Canary Is. (q.v.). 2. See ISLES OF THE BLEST.

Fortunatus, popular collection of tales, centring on the adventures of F., his son, with their inexhaustible purse and wishing-cap, the moral being that worldly prosperity alone is insufficient to produce lasting happiness. The book originated about the end of the fifteenth century, though some of the legends included are of older date still. The oldest printed ed. now extant bears the date 1509. Versions of the story have appeared in Ger., Fr., It., Dutch, Eng., Dan., Swedish, and Icelandic. The story was dramatised by Hans Sachs in 1553, and by Thomas Dekker in 1600. An unfinished narrative poem of the tale, entitled 'Fortunatus and his Sons,' was left by Ludwig Uhland. See J. J. Görres, *Die deutschen Volksbücher*, 1807; Father W. V. Schmidt, *Fortunatus und seine Söhne*, 1819; and H. Günther, *Fortunatus*, 1914.

Fortune-telling. Under the Vagrancy Act of 1824 in England any one pretending to tell fortunes is liable to imprisonment as a disorderly person, but prior to this date, the telling of fortunes by palmistry, astrology, or other forms of divination was not an offence against the law. The art of palmistry, viz. revealing and foretelling events, past and future, by examination of the palm of the hand, is of great antiquity, and there is much reference to the subject in different writers. See DIVINATION and PALMISTRY.

Fortuny y Carbó, Mariano José Bernardo (1833-74), Sp. painter and etcher, b. at Reus in Catalonia. He studied in the academy of Barcelona, and in 1856 won a prize which enabled him to study at Rome. During the Sp. war against Morocco, F. followed the army to Africa and filled his portfolios with studies from life. He had an exceedingly dexterous touch, and treated his subjects simply as colour schemes for gorgeous draperies and vivid sunlight. F.'s work is distinguished by a superlative facility of execution, and a marvellous cleverness in the arrangement of colours. Some of his most noted pictures are: 'The Spanish Marriage,' 'The Poet,' 'The Rehearsal,' 'The China Vase,' 'The Trial of the Model,' 'An Ecclesiastic,' 'Don Quixote,' 'The Snake Charmers,' 'Moors Playing with a Vulture,' 'Hindoo Snake Charmers,' 'The Butterly,' 'Camels at Rest,' etc. A large number of his works are in America, both in public and private possession. See C. Davillier, *Fortuny, sa vie, son œuvre, sa correspondance*, 1876; and lives by C. Yriarte, 1886; E. Calvi, 1911, and J. Cervi, 1920.

Fort Wayne, Indiana, U.S.A., cap. of Allen co., 148 m. from Chicago. It is an important railway centre, and manufs. organs, woollens and engines. It is the seat of a Catholic bishop and has a convent, academies, and colleges. Pop. 118,400.

Fort William, Calcutta, name given to

Fort William

three vls. conferred upon the E. India Company in 1700 by the Emperor Aurungzebe. They were imminedately fortified, and received their name in honour of William III.

Fort William, city of Ontario on the delta of the Kaministiquia R., on the shores of Lake Superior, Canada, 600 m. N.W. of Toronto. Has one of the finest land-locked harbours in the world. The city has ten parks, the largest, Chippewa Park, having 3 m. of shore line on the lake. Has a fine library, collegiate school and vocational school; all public utilities are municipally owned. It is on the Canadian National and Canadian Pacific railways, and there is a good airport 4 m. distant. Its chief business activities are railways, shipping, grain elevators and allied waterfront undertakings, paper and pulp mills, general timber operations, water power, steel products. It is the greatest coal-handling centre in Canada, having handled 2,500,000 tons in 1948. Originally settled by Fr. fur traders in 1678 as Fort Kaministiquia, was renamed F. W. in 1806. Notable as ann. meeting place of old 'fur brigades' from far W. and N. with Hudson's Bay Company's dealers from Montreal. Incorporated as a city in 1907. Pop. 33,600.

Fort William, tn. of the co. of Inverness, Scotland, near the head of Loch Linnhe, at the S. end of the Caledonian Canal. The fort was built in 1665 by Gen. Monk; rebuilt in 1690; besieged by the Jacobites in 1746, and demolished in 1890 to make room for a railway station. For many years F. W. was the key of the Highlands, and is now a well-known centre for tourists and mt. climbers. Ben Nevis, 4106 ft., the highest mt. in Great Britain, is 3 m. S.E. of the tn. Pop. 3100.

Fort Worth, city of Texas, U.S.A., cap. of Tarrant co., on Trinity R., 30 m. from Dallas. It is on the Missouri, Kansas and Texas, Texas and Pacific, and other railways. There are flour and grist mills, machine shops, foundries, and tanneries. Manufs. include flour, woollen and cotton goods, cotton-seed oil, agric. implements. F. W. is the seat of a polytechnic college, it has a stockyard, a univ. (1881), and a medical college. There are also a court-house, a city hall, and two opera houses. Pop. 177,800.

Forty, cardinal number equivalent to four tens, denoted by the symbols 40 or XL. From time immemorial this number has apparently been regarded with superstitious veneration by both Jews and Moslems, and figures largely in the Bible and in Mohammedan writings. See notes to W. A. Clouston's *Group of Eastern Romances and Stories* (privately printed, 1889) for Biblical references. Moslems mourn F. days for their dead, and consider women ceremoniously unclean until F. days after childbirth. Similarly the number 4 appears repeatedly in Moslem fictions, as in the Arabian Tale of the Third Calender, or *Aladdin and his Wonderful Lamp*, or the Persian romance of *Ndsir*. (Gangs of robbers in E. tales usually number F. (cf. *Ali Baba and the Forty Thieves*). In Wales F.

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Foscari

loaves of bread and F. dishes of butter commonly occur in records of rent paid to the bishop of Llandaff. A bard's fee for his song was 40d. if a disciple, twice 40d. If a master. Ships suspected of being infected with cholera or any infectious disease are placed under quarantine, forbidden to land passengers or cargo, for F. days. The privilege of sanctuary lasted F. days. There is a popular superstition that St. Swithin's Day is followed by F. days of either rain or sunshine.

'Forty-five ('45), The, term employed by modern writers for the year 1745 and the Jacobite rising under Prince Charles Edward, 'the Young Pretender,' or 'Bonnie Prince Charlie,' which was crushed at Culloden Moor 1746. See Hume Brown, *History of Scotland*, iii., 1909.

Forty-shilling Freeholder, see ELECTORATE.

Forum, in Rom. times the central public space of a city, especially the market-place of Rome itself, the *forum magnum*, extending from the foot of the Capitoline to N.E. of the Palatine. It was used as a place of assembly for political, judicial, and other public business. Discussions were held there, and speeches made from the *rostra*. By degrees the original single forum developed into numerous different fora, each for some special purpose. See H. Jordan, *Topographie der stadt Rom im Alterthum*, 1871; O. Marucchi, *Le Forum romain*, 1901; Charnier, *New International Encyclopædia*; and Smith, *Dictionary of Classical Antiquity*.

Forum Appii (mod. Foro Appio), small tn. of antq. Latium, Italy, on the Appian Way among the Pontine marshes, 43 km. from Rome. A canal started from here, running S. nearly to Terracina. See Horace, *Satires*, I. v. 3; Acts xxviii. 15. Forum Julii, see FRIDUS.

Forum Sempronii, see FOCEOMBRENE.

Foscari, Francesco (b. c. 1372), a doge of Venice (1423-57). In early life he was guardian of the young marquis of Mantua, and won fame as one of the procurators of San Marco. As doge he waged numerous wars against Filippo Maria Visconti, duke of Milan, and other It. princes, securing Carnagno as general of his allied forces. After the first war (1426-27) Venice won the prov. of Cremona, Bergamo, and Brescia. The second war (1431-33), after a hard struggle, fixed the Adige as the Venetian boundary. A third war, against Bologna, Milan, and Mantua, broke out about 1435. Supported by Cosimo de' Medici and Francisco Sforza, Venice finally conquered Bellagio, Peschiera, and Lomato. The peace of Lodi (1451) put an end to hostilities. F.'s later life was clouded by the cruel machinations of his rival, Jacopo Loredano, especially directed against F.'s son, Jacopo. The latter, according to legend, was condemned and tortured, probably unjustly, by the Council of Ten, 1444-57. Research, however, seems to have established this story of the cruelty of Jacopo's accusers is, in details, apocryphal, and that in fact Jacopo was treated with exceptional leniency. The doge was de-

posed in 1457, and d. a few days later
See Byron's tragedy, *The Two Foscari*,
1821; S. Rogers, *Italy*, 1839, Verdi's
opera, *I Due Foscari*, 1844, H. Brown
Venice, 1863, and H. Kretschmayr,
Geschichte Venedigs 1920-34.

Foscolo, (Niccolò) Ugo (1778-1827). It
poet and patriot, went to Venice from his
bp Zante about 1793. From 1798 on
ward he was an officer in the armies of
various attempted It. republics and
served in France (1804-6). In 1808 he

Journey *See* F. Le Monnier, *Collected Works* 1850-62 and ed by Tobler,
1871; G. Gemelli, *Della vita e dell'opere di U. Foscoto*, 1830; G. Chiarini, *Gli amori di U. Foscoto*, 1892, and *Poeste di U. Foscoto*,
1882; G. Cittanova, *La Poesie di Ugo Foscoto* 1932, also lives by G. Chiarini,
1910, 1927, C. Antonia Traversi and A.
Ottolini, 1927-28, A. Viviani 1938, and
F. Flora 1940.

Foss, Foss-way, or Fosseway, one of the
great ant. military roads constructed by



THE FORUM ROMANUM FROM THE CAPITOL
An engraving dated 1864

In the foreground are the Arch of Septimus Severus, the Temple of Fortune, the Column of Phocas and three columns of the Temple of Jupiter Stator. At the end of the Via Sacra are the Arch of Titus, and to the left, the Colosseum.

was appointed to the chair of eloquence (shortly afterwards abolished in all Italy) at Pavia Univ. delivering the discourse 'Dell'origine e dell'utilizzo delle letterature.' His tragedy, *Ajace* (performed 1811, first pub 1828), supposed to contain hints at Napoleon whom he no longer admired, caused him to leave Milan till 1813 and the decline of Napoleon's power. When the Austrians regained control of the tn., F.'s patriotic sentiments forced upon him a voluntary exile in Switzerland and England (c. 1816). His remains were removed from Chiswick to Florence, 1871. His works include *Le Ultime lettere di Jacopo Ortis* (1797 a novel partly founded on Goethe's *Werther*), *Lugia Pallavicina caduta da cavallo* and *All'amica risanata* (two odes 1799-1803), *I Sepolcri* (1807-8), *Sul testo della Commedia di Dante* (1842 ed of Dante's poem); trans of Homer, and Sterne's *Sentimental*

the Rom. in England and other parts of Europe so called from the fossae on either side to keep it well drained and dry. This road or series of roads ran from Lincoln, via Leicester (Ratcliffe) and Bath to Exeter. It went past Newark and High Cross (Venonit.) intersecting Watling Street at a point called 'the centre of England,' then on past (Cirencester, Bath, the hills near Chard, Axminster, and Honiton to Exeter. It is mentioned by eleventh century writers as one of four 'royal roads' in Britain. *See also WALKING STREET.* *See* E. Guest, 'The Four Roman Ways' in *Origines Celticae*, 1883; and H. W. Tupperley, *Shropshire Hills*, 1947, also I. D. Margary, *Roman Ways in the Weald*, 1948.

Foss, or Fossa (Lat. *fossa*, a ditch; from *fodere* to dig), in fortification a long narrow excavation, such as a moat or ditch, dug outside the walls or rampart of a fort to serve as barrier against the

advancing foe and prevent an escalade. It is often filled with water or with abatis and palisades.

Fossa (*Fossan*), or **Foussa**, largest carnivorous mammal of Madagascar. A link between cats and civets, it is about twice the size of a house-cat (about 5 ft. long), with a long tapering tail, and sharp, curved, retractile claws. The naked soles of the hind feet rest entirely upon the ground in walking. The colour is usually a uniform, unspotted, pale brown, and the hair short and close. These animals are of a very savage disposition, and of nocturnal habits. They feed on small animals and birds, sometimes invading poultry yards. They are usually regarded as representing a group within the civet family (*Viverridae*), under the name *Cryptoprocta ferox*.

Fossa Clodia, see CHIOOGIA.

Fossa et Furca, see PIT AND GALLOWS.

Fossano (*Fons Sanus* or *Fossanum*), tn. and episcopal see of Piedmont, Italy, Cuneo prov., 14 m. from Saluzzo, on R. Stura. It has old walls, a cathedral with good paintings, palaces, theatre, a scientific academy, and a fourteenth-century castle. There are mineral baths, and manuf. of paper, leather, and silk. Pop. about 18,100.

Fossil Copal, hard resin found in the earth as the product of trees long since dead. Copal is a name given generically to almost any resin that is capable of being used in the preparation of varnish. The variety known as F. C. is found in the regions around Zanzibar, where it is dug up in the form of pebbles or nuggets.

Fossils. The term F. (Lat. *fossus*, dug up) was formerly applied to any object taken out of the earth's crust, whether mineral or organic. Its meaning has now been restricted so as to include only the remains or traces of animals and plants which have been buried in the earth by natural causes. We therefore include under the term not only remains of organisms but objects which point to the previous existence of organisms. Thus the footprints of animals and the burrows and trails of worms in shales and sandstone are as much F. as are the remains of the organisms themselves. The majority of F. are the actual parts of animal or plant organisms, such as the shells of molluscs, the calcareous skeletons of corals, the teeth and bones of vertebrate animals, and the trunks, branches, and leaves of plants, the state of preservation being dependent on the amount of change undergone subsequent to their burial. For preservation in the F. state it is self-evident that the organism must be covered up by sediment, or it will disappear by the processes of decay. The remains, then, of terrestrial animals and plants are less likely to become preserved than marine organisms, and the conditions must necessarily be local. Hence, land plants and animals may be found in lakes, peat bogs, and marshes, in deltas, mineral springs, etc. Thus we have the Irish elk preserved in the peat bogs of Ireland, land animals and herbage which have been swept by rivers into lakes and deltas and

there deposited, together with fauna and flora of distinctive lacustrine type, and we have also higher forms of terrestrial life preserved in 'bone caves.' It is in the sea that the most favourable conditions for the preservation of organic forms prevail. In the marginal waters of the ocean sheets of mud and sand are laid down and cover the remains of the fauna which flourish there. Masses of organic limestone (e.g. fossilised sea urchins and foraminifera) are formed in the deeper waters, and, finally, in the deepest parts of the ocean we have only the remains of the harder parts of organisms, such as teeth and ear bones covered up in the abyssal sediments. The conditions of the preserved remains depends upon the structure and composition of the organisms, and also on the manner of fossilisation. The skeletons of most vertebrates consist of calcium phosphate. In the invertebrates the durable parts may be carbonate of calcium (calcite or aragonite) as in the mollusca, or may be composed of silica as in the diatoms. The relics of insects preserved to us we owe to the durability of their chitinous integuments, while coal is the result of the preservation of the durable cellulose and wood of the plants. As regards the condition of preservation, we may distinguish the following types: (1) *The original substance is preserved unaltered*. In the case of the Siberian mammoth, the whole carcass is retained, while entire insects have been preserved in amber. All bodies originally stony, such as shells, corals, and, in a lesser degree, trees and their fructifications, are sometimes wholly preserved. Naturally, we find F. least changed from their original condition in the newest rock formations and most changed in the oldest, but all fossiliferous strata contain some F. which are practically unaltered.

(2) *The original substance is replaced by mineral matter with partial or entire preservation of the structure of the organism*. This is also known as petrification, the organic matter being replaced, molecule for molecule, by mineral matter, such as calcite or silica. The most intricate structure has thus been preserved, as in the case of silicified wood, where the organisation of the plant may be seen under the microscope as distinctly as in the section of a modern tree. The aragonite shells of invertebrates, such as Gastropods and Lamellibranchs, are dissolved away, and entirely replaced by more durable calcite, forming 'pseudomorphs' after aragonite.

(3) *The original substance is wholly removed, the external form being retained*. After mineral matter has gathered round the organism and hardened there, the organism itself decays. There is left, then, merely a hollow mould retaining the external form of the organism. These hollow casts may be filled later by mineral matter, which may have been mechanically deposited or chemically precipitated from infiltrating waters, forming what are called 'solid casts.' These casts show none of the internal structure of the organism but only the external form.

F., as well as being of interest as records

of the progress of organised life on the globe, and lending strong support to the doctrine of evolution, are of use to the geologist in throwing light on the former conditions of physical geography. The distribution of sea and land, the various changes of climate, and the distribution of plants and animals in past times are indicated. Further, they are of great importance in geological chronology. The order of superposition of the strata having been determined, it has been possible by the use of the contained F. to correlate the sequence of stratified formations in different parts of the world, still further to fix stratigraphical horizons and subdivides any one formation into a series of life zones. The fossil hist. of some animals, e.g. the boro, is now known in great detail, and the evolution of man has been partly traced by his fossilised remains. *Archæopteryx*, an interesting missing link between reptiles and birds, is illustrated in the article *BIRDS*. See also ANTHROPOLOGY, GEOLOGY, and PALEONTOLOGY. See C. Darwin, *Origin of Species*, 1859; H. Nicholson, *Manual of Palaeontology*, 1872, and the *Monographs of the Palaeontological Society*; A. Seward, *Fossil Plants*, 1892, and *Plant Life through the Ages*, 1931; H. Hutchinson, *Extinct Monsters*, 1892; W. Deeke, *Fossilisation*, 1923.

Fossils, Money, see NUMMULITES.

Fossombrone (Forum Sempronii), tn. and episcopal see of the Marches, Italy, prov. of Fano and Urbino, 16 m. from Fano, on R. Metauro. It has a cathedral, silk manuf., and mineral springs. The tn. was seriously damaged in the Second World War. The bridges of Trajan and Diocletian, and the bridge of Marchionni, were all blown up and destroyed by the Germans, and much damage was done to the museum and library. Pop. (com.) c. 11,000.

Fossombroni, Vittorio, Count (1754-1841). It. statesman and scientific writer, studied at Pisa Univ., excelling in mathematics and philosophy. He became minister of foreign affairs to the grand duke of Tuscany (1796), and held offices under the new gov. of Bonaparte (1799). Refusing to act as councillor of state on the formation of the kingdom of Etruria (1801), he consented to act as commissioner of finance. On the restoration of the grand duchy (1814) F. became Prime Minister, under Ferdinand III and Leopold II. He put Tuscan finances on a sound footing. He wrote treatises on hydraulics, mathematics, etc., including *Sur l'intensité de la lumière* (1782); *Mémoire idéologique sopra la val di Chiana* (1789); *Sur le principe de la vitesse virtuelle* (1796); and *Sur l'amélioration des marais Pontins* (1805). See G. Capponi, *Il Conte V. Fossombroni*.

Foster, Sir Michael (1836-1907), Eng. physiologist, graduated at London Univ. in medicine, 1859. He practised for a time at his native Huntington, then returned to London, becoming prof. of practical physiology at Univ. College, 1869, and at Trinity College, Cambridge, 1870-83. He was biological secretary of the Royal Society, 1881-1903; and prof. of

physiology at Cambridge Univ., 1883-1903. In 1900 he was Liberal representative of London Univ. in Parliament, but was defeated in 1906. F. was chairman of the royal commission on tuberculosis, and member of that on sewage disposal. He greatly influenced the study of biology in Great Britain. His works include *Primer of Physiology* (1874); *Studies from the Physiological Laboratory in Cambridge University* (1876-77); *Textbook of Physiology* (1876); *The Elements of Embryology* (with F. M. Balfour) (1874); *Course of Elementary Practical Physiology* (with J. N. Langley) (1876); *Lectures on the History of Physiology in Sixteenth, Seventeenth, and Eighteenth Centuries* (1901). He was joint editor (with Sir E. Ray Lankester) of *Scientific Memoirs of Thomas H. Huxley* (1898-1902).

Foster, (Myles) Birket (1825-99) Eng. painter and engraver, early apprenticed to the wood-engraver Landells. He engraved plates for Gray's *Elegy*, Coleridge's *Ancient Mariner*, Longfellow's *Kranegeine* (1850), *Old English Ballads*, and the works of Milton, Goldsmith, and others. From 1853 F. began painting in water-colours. His landscapes and scenes of rural and child-life were his best works. Some of the best known are 'Nutting', 'The Bird's Nest', 'Sailing the Boat', 'Cows in the Pool', 'Feeding the Ducks', 'Arundel Mill', 'Castle of Rheinfels.' His illustrated *Christmas with the Poets* appeared in 1850; *Couper's Task* (1853); *Brilliant* (1873); and *Some Places of Note in England*. See Scherer, *The Birket Foster Album*, 1880; and H. M. Cundall, *B. Foster*, 1906.

Foster, Stephen Collins (1826-64), Amer. song composer, b. near Pittsburgh, Pennsylvania. He is especially noted for his Negro melodies, which have become very popular in all Eng.-speaking countries, notably; *The Old Folks at Home*; *Massa's in the Cold, Cold Ground*; *Louisiana Belle*; *Come where my Love lies Dreaming*; *Nellie Bly*, etc.

Fostoria, tn. of Ohio, U.S.A., in Seneca co., S. of Toledo and 21 m. S.W. of Fremont. It is intersected by five lines of railway, and is therefore an important railway centre. There are flour mills and glass works. Pop. 14,400.

Fothergill, John (1712-80), Eng. physician of Yorkshire. He was a Quaker, and noted for philanthropy and professional skill. He helped to found a school for Quaker children at Ackworth, and assisted Howard in his efforts to reform prison management. He wrote papers for *Philosophical Transactions*, and for *Medical Observations and Inquiries by a Society of Physicians in London* (1773-75). His *Account of the Sore Throat* (1748) won him fame. See *Works* (Lettsom's ed.), 1783-84; *Memoirs* by J. Elliot, 1781; Thompson, 1782; and J. C. Lettsom (4th ed.), 1782; and *Lives of British Physicians*, 1830.

Fotheringhay, par. and vil. of Northamptonshire, England, on the R. Nene, 9 m. S.W. of Peterborough. A castle was built here in the time of William the Conqueror, but was much altered and

enlarged by the son of Edward III. Here Richard III. was b., and Mary Queen of Scots was imprisoned and executed, 1586. The mound and moats still remain. The magnificent fifteenth-century collegiate church is but the nave, aisles, and W. tower of a far larger structure, the choir and aisles of which were destroyed at the Reformation. On the S. side of the nave are the foundations of the collegiate buildings. Pop. 200.

Foucauld, Viscomte Charles de (1853-1916), Fr. explorer and hermit, b. at Strasburg, famous in the annals of Fr. exploration in the Sahara. At one time a soldier, and later monk and hermit. In 1883-84 he travelled through the first and middle ranges of the desert and, disguised as a Jew, made three routes over the Great Atlas Mts. Lived as a hermit at Tamanrasset, and was assassinated on the doorstep of his hermitage in 1916. He enjoyed the greatest prestige with the Hloggar Tuaregs, who to-day consider him a saint and martyr. He compiled, amongst other works, a Tamashek dictionary, and made a collection of Tuareg poems and proverbs. His name is spoken, and his life and work are immortalised, in every corner of Algeria. See E. F. Gautier, *Le Sahara, Contre-éclat du Sahara*, 1881-1909, and *Oasis Sahara*, 1905; P. Turnbull, *Sahara Unveiled*, 1940; and P. de Boissieu, *Le Père de Foucauld*, 1945.

Foucault, Jean Bernard Léon (1819-68), Fr. natural philosopher and mechanician, noted for his investigations in optics and mechanics. He perfected the process of Daguerre and Nièpce, known as the daguerrotype process, and worked with Fresnel and Arago. In 1844 he invented an apparatus for using electric light in optical experiments and microscopic researches. From 1845 he conducted the scientific section of the *Journal des Débats*. F. demonstrated the earth's rotary motion by means of the pendulum, and invented the gyroscope (1851-52). After that his fame was firmly estab. He became physicist to the imperial observatory, 1855, and won the Copley medal of the Royal Society for his researches concerning the velocity of light, showing it not to be the same in a vacuum as in the air. His scientific treatises form part of the *Bibliothèque d'instruction populaire*. F. became a member of the Academy of Sciences, 1863. He was about to undertake astronomical researches with the aid of physics when his health failed. See J. Lissajous, *Notice historique sur la vie et les travaux de L. Foucault*, 1875; C. M. Garrel and J. Bertrand, *Recueil des travaux scientifiques de L. Foucault*, 1878.

Fouche, Joseph, Duke of Ortranto (1759-1820), Fr. statesman, b. at Le Pellerin, Nantes, brought up at the Oratoire. On the outbreak of the revolution he was principal of the college of Nantes. In 1792 he represented Loire-Inférieure in the national convention, and sided with the Montagnards. Chosen to organise the resistance to the rebellion of La Vendée and that at Lyons (1793), he assisted in the cruelties of Collot d'Herbois. Re-

turning to Paris, he was elected Jacobin president, and helped to overthrow Robespierre. F. became minister of police of Paris (1799), retaining this office under Bonaparte till 1802. He was recalled in 1804, and granted various titles. After 1810 F. was replaced by Savary in Napoleon's favour, as he was suspected of intriguing with the Bourbons. For a time F. held office under Louis XVIII., but was forced to resign (1815), and d. in exile. His writings include *Notes sur mes ministères étrangers* (1815); *Lettre au duc de Wellington* (1817); *Mémoires* (1824, probably genuine). See Le Comte de Martel, *Étude sur Fouché*, 1873-79; L. Madelin, *Fouché*, 1901; E. d'Hauterive, *La Police secrète du premier Empire*, 1907; and S. Zweig, *Fouqué*, 1930.

Fouquet, Jean, see FOUCQUET.

Fougères, tn. of France, in the dept. of Ille-de-Vilaine. It is the cap. of that arron. also, and is situated 30 m. N.E. of Rennes. Leather, boots, and flannel are manufactured, and there are glass-works. F. has an ancet. castle, and sev. interesting old churches. There is a monument to the soldiery who fell in 1870-71. Pop. 19,200; arron. 81,000.

Fouillié, Alfred Jules Emile (1838-1912), Fr. philosopher, a member of the academy of moral and political sciences. He greatly influenced modern philosophy thought. His *Mémoires sur la philosophie de Platon* (1869) and *Mémoires sur la philosophie de Socrate* (1874) were crowned by the Academy. Other works are *La Liberté et le déterminisme* (1883); *Histoire de la philosophie* (1875); *La Science sociale contemporaine* (1880); *Critique des systèmes de morale contemporains* (1883); *La Morale, l'art, et la religion, d'après Gayau* (1889); *L'Évolutionisme des idées-forces* (1890); *Tempérance et caractère* (1895); *Psychologie du peuple français* (1898); *Le Moralisme de Kant et l'amoralisme contemporain* (1905); *La Morale des idées-forces* (1907). His wife wrote under the pseudonym 'G. Bruno.' See A. Guyan, *La Philosophie et la sociologie d'A. Fouillié*, 1913.

Foulahs, or Foulhas, see FULAHS.

Fould, Achille (1800-67), Fr. financier and politician, of Jewish parentage. After the revolution of 1848 he was minister of finance, and as such introduced many innovations and improvements. He became senator and minister of state (1852-1860). F. gave the first impulse to the foundation of the Crédit Mobilier (q.v.). He was reappointed minister of finance by Louis Napoleon (1861-67), having resigned (1852) on the confiscation of the property of the Orleans family.

Foulds, John Herbert (1880-1939), Eng. composer and conductor, b. in Manchester; his father was a member of the Hall Orchestra, Manchester, and F. began his professional career as a cellist in that orchestra. He was conductor of the Univ. of London Musical Society. As a composer he theorised, like Busoni, on the subject of quartal-tones, and even smaller intervals than these, experimenting in the use of micro-tones in his *Dynamic Triptych*, and in that of tertia-tones in his

orchestral *Music-Pictures*, Op. 33 (1913), and in parts of his chief work, *World Requiem*, Op. 80 (1923). His many and varied works include also songs, a cello sonata, Celtic suite, choruses in the *Hippolytus* of Euripides, *Gandharva-Music*—his wife, Maud McCarthy, besides being well known as violinist, was an authority on Indian music; and much incidental music for theatre productions, such as Ernest Toller's *Masses and Men*, Sacha Guitry's *Deburau*, and Tagore's *Sacrifice. Wrote Music To-day* (1931).

Foulis, Andrew (1712-75) and **Robert** (1707-76), two noted Glasgow printers, who set up their business in 1711. Robert became printer to the univ. in 1743. They followed their profession for over thirty years, issuing eds. of Gk. and Lat. classics, poetry, plays, trns., etc. Their 'Immaculate' *Horace* (1744) is famous, but has six misprints. Another famous work is the fine folio *Homer* (1756-58). In 1753 they founded an academy at Glasgow for engraving and modelling. The expenses incurred unfortunately proved their ruin. Their collection of old masters was sold by auction at Christie's in 1776, after Andrew's death. See W. J. Duncan, *Literary History of Glasgow* (Maitland Club), 1831; J. Ferguson, *The Printers Foulis*, 1880; and D. Murray, *Robert and Andrew Foulis*, 1913.

Foundations, in building, the base upon which the structure is built up, generally used of those parts of the building which are below the level of the ground and whose purpose is to determine the way in which the weight of the building shall be applied to the earth. In all buildings the weight is concentrated in certain small areas, the bases of walls, columns, etc. The aim of foundation courses is to distribute that weight over as large a surface as possible, so that each square yard shall support as little weight as possible. The possibilities of well devised F. are illustrated by the construction of the Eiffel Tower, where a weight of 7500 tons is so distributed that each square foot sustains only 2½ cwt. The measures to be taken for the construction of F. depend upon the weight of the building in comparison with the area of the base, the manner in which the weight is distributed, and the character and circumstances of the underlying earth. The character of land used for building varies from hard stable rock to loose sand or marshy soil. Between these extremes are gradations of soft rock, firm earth, hard compact clay, dry gravel, and dry close-packed sand. The presence or absence of water is a great consideration, as anything in the nature of a fluid foundation is obviously unstable. The slope of the strata and the possibility of sliding effects are also matters of importance. In order to ascertain the methods and measures necessary, borings are made in the ground so that the succession and depth of strata may be determined. When the ground consists of hard rock little needs to be done except procuring a level surface upon which to build the walls. Where the foundation is earth a certain amount of excavation has

to be done, and the first courses are laid down to a breadth exceeding the width of the walls to be supported. Usually the excavations are filled in with concrete and the brickwork is laid on top of the concrete. According to the London Building Acts the footings, or courses, laid nearest to the concrete, must project on each side to half the thickness of the wall and must diminish with each course to a height equal to at least two-thirds of the thickness of the wall. When the nature of the earth or the presence of water renders the natural F. unstable, it is necessary to have special F. to procure the requisite rigidity.

For small buildings on soft ground the distribution of the pressure may be effected by laying down a row of stout planks spiked together, and superposing another row of planks laid transversely, the brickwork then being commenced on the planking. For large buildings on loose and untrustworthy ground some method of piling is adopted. In the simplest cases piles shod with iron points and headed with metal bands are driven down by releasing a weight some distance above them. Where it is necessary to enclose thoroughly a section of earth, sheet piling is used. This consists of piles driven in at intervals and timbers driven in between so as to make a continuous wall; this prevents lateral shifting of loose earth. In providing for larger buildings the piles are reinforced by concrete. The heads of the piles are rigidly connected, and are set in concrete. Iron girders are also used to connect the various vertical supports and the whole mass is set in concrete, thus giving the effect of a solid block of concrete underlying the whole area of the building. Concrete piles are often used for the building of bridges over rvs., or for heavy buildings on marshy land. The piles are made of blocks of Portland cement concrete sunk in by excavations made after they are placed in position. Sometimes cylinders of brickwork are constructed; these are gradually carried downwards and filled with blocks of concrete. This somewhat resembles the so-called 'well' F. employed for the Madras public buildings. A circular course of bricks about 3 ft. across is laid on the ground and firmly cemented together. The earth is then excavated within and without the circle so that the course sinks. Another course is then laid on top and the excavation proceeded with once more. In this way successive courses are built up, or rather allowed to sink down, to a depth of about 12 ft., and the inner space is filled with rubble.

Where special circumstances make it impossible to sink a deep foundation directly underneath a heavy wall, the cantilever system is sometimes adopted. The foundation piers are sunk some distance from the wall to be supported, and steel cantilevers are run out from these piers to the wall; they are built into the wall at one end and are firmly secured to piers at the other. The difficulty of water which cannot be drained away is sometimes met by constructing what is

called a 'dock' foundation. This consists of the construction of a closed wall of concrete built round a bed of concrete covering the whole area, thus forming a concrete tank which prevents the entrance of water. Cofferdams (q.v.) are also used in the construction of F. on wet sites. Wooden piles are driven down about 6 ft. apart, and the intervals filled in with sheet-piles. A double wall of these piles is built enclosing the site, and the space between the boards is filled with clay puddle, thus forming a watertight barrier which keeps the enclosure dry. The F. may then be laid within this temporary structure. See W. M. Paton, *A Practical Treatise on Foundations*; L. White and E. Prentis, *Modern Underpinning*, 1929.

Founder, see under **HONOR** (**DISEASES**).

Founders' Shares. When a limited liability company is formed, provision is usually made that, after outside shareholders have received a reasonable profit upon their investments, the original owners of the business or other founders of the company shall receive the larger share of benefit from any excess profit. In the early days of limited companies this was often contrived by the issue of F. S. to these privileged persons. The plan worked fairly well in many cases, as the especial benefits they carried did not become operative until the public subscribers had obtained a satisfactory profit. It was discovered however by some rather unscrupulous promoters that, by the insertion of apparently innocent conditions and advantages for these special shares in the articles of association, it would be possible to saddle the outside investor with all the loss, and give him little of the profit. In consequence F. S. fell into disrepute, and the more satisfactory method of issuing preference shares was generally adopted where it was thought desirable to have two classes of shareholders. The newer method gives the outside investor the first claim upon profit up to a certain percentage, but when he has received that share, he only benefits in any further profits that may be made in such a way as his arrangement or the prospectus has defined. Preference shares are of so many kinds, and can be issued upon so many conditions, that there is no object now in issuing shares of which the popular record is unsavoury.

Founding, or Metal Casting, see **CASTING; IRON AND STEEL; STEREOTYPING; TYPE AND TYPEFOUNDING; TYPE-CASTING AND TYPE-SETTING MACHINES**.

Foundling Hospitals, or Asylums. Originally these were institutions for the rearing and care of children who were deserted by their parents, by means of private charity, or at public expense. They were intended mainly to prevent infanticide or wilful procurement of abortion, and the exposure and abandonment of children.

The more enlightened Rom. emperors, Constantine, Valentinian, and Justinian, took measures to abolish such offences. In the sixth century the bishop of Trèves ordained that the Church should support

all children abandoned and placed in a marble basin by the cathedral porch. The caputularies of the Frankish kings mention similar arrangements. The Council of Nicaea in A.D. 787 decreed that every city should have an institution for the care of neglected children, resulting in the first true foundling hospital (as now understood) at Milan (787), estab. by Dathetus. Between the eleventh and fourteenth centuries many similar institutions followed this in France, Italy, and Germany. In France, especially, the subject received much study and attention. Children were first received in the porch of Notre-Dame at Paris. Marguerite de Valois opened a special home in 1536, but no sum was set aside by the state for the maintenance of the foundlings till 1552. The bishop of Paris founded the Couche, but owing to limited accommodation children could only be taken by drawing lots.

St. Vincent de Paul and Colbert, in the seventeenth century, tried to remedy the evils that had become prevalent, and the former estab. a home in 1638. Out of it grew the famous Paris foundling hospital, incorporated in 1670 under Louis XIV. The Couche was united with it in 1688, and Marguerite de Valois's orphanage in 1772. This hospital takes in all *enfants assistés*, including illegitimate children and *enfants moralement abandonnés* (incurables), as well as real foundlings (*enfants trouvés*), almost indiscriminately. The children are generally boarded out in the country after a few days, a sum being paid for their keep, but decreasing yearly and ceasing when the child is twelve years old. The child then usually becomes the apprentice or servant of its foster-parents, but is more or less under gov. supervision till the age of twenty-one. This institution also aims at helping poor parents, and allows the reclaiming of children at any time. Capt. Coram's foundling hospital in London was estab. in 1739, but reserved for illegitimate children. Real foundlings and waifs and strays are admitted to Dr. Barnardo's Homes, Wantage Infant Orphan Asylum, or similar institutions. In the early nineteenth century an arrangement called the 'cradle-tour' (revolving basket or box) was in use for admitting children secretly. This system existed at Marcellis in the thirteenth century, but was much abused, and mostly abolished as illegal in 1834. Since 1801 children are admitted to the London foundling hospital only after personal examination of the mothers. The previous good character of the mother and her necessity, and the desertion or death of the father, must be known to the committee. Admission is free, and no payment is taken; all children admitted must have had their applications approved before they were two months old; some live in the hospital, while others are boarded out. In 1925 the historic site was sold for £1,650,000, and the governors temporarily housed the children in the former Royal Asylum of St. Anne's Society, Redhill, Surrey. In 1929 they completed the purchase of the

Ashlyns Hall Estate, Berkhamsted, Hertfordshire, with 200 ac. of open land on a healthy altitude, for the permanent estab. of the new foundling hospital. The London offices are 40 Brunswick Square, W.C.1. The musical traditions inaugurated there by Handel are still kept up. At Moscow and St. Petersburg (Leningrad) two such institutions were founded by Catherine II. (1729-96). They are to be found also in Italy, Austria, Spain, Scandinavia, China (Canton, 1856), Mexico, Buenos Aires (1774), Rio de Janeiro, and elsewhere. There are many (mostly privately supported) homes in U.S.A. such as the almshouses, Sisters of Charity Foundling Asylums (1869), Infants' Hospital (1868), Infant Asylum (1871), all at New York. The Dublin Home (1704-1835) was closed owing to the high rate of mortality. The death-rate often ranged from 90 per cent upwards, and averaged 75 per cent. In France and London, especially, this very high figure has now been reduced to about 4 per cent and under. See also CHILD WELFARE AND LABOUR. See II. Folks, Care of Neglected and Dependent Children, 1902; Henderson, Dependents, Defectives, Delinquents, 1901 and Modern Methods of Charity, 1901; - L'age, The Foundling Hospital, 1925; Women's Group on Public Welfare, Children without Homes: Proceedings of a Conference, 1945; and II. Donington, The Care of Homeless Children, 1946.

Fountain (Fr. *fontaine*, from late Lat. *fontana*, from Lat. *fons*, spring), term applied to places where there is a continual flow of fresh water, by either artificial or natural means. The earliest existing example is that of the Babylonian F., dating from 3000 B.C., and next comes the Assyrian F. at Bavian, sculptured in the face of the rock and consisting of a series of basins descending in steps to the stream. Antq. Gk. F.s. of any size were usually enclosed, and were common in the cities, springs being plentiful in Greece. They were dedicated to gods, goddesses, nymphs, deities, etc., and were frequently placed in or near temples. The water-supply of Rome was on a large scale, and the remains of the aqueducts form some of the most striking monuments of Italy. These supplied the baths and the public F.s., which were of a large size and numerous. Public and private F.s. were some of the most interesting of the Pompeian discoveries; the private ones were of rich and varied shapes, generally in the form of a niche. Utility was the first object of a F. in early times, and in this, where a number of people might require to draw water at the same time a large basin was erected with a pillar in the centre, from which pipes, each with a separate jet to supply the running water, radiated all round. Many examples of this kind of F. remain throughout Italy and in the old Ger. tns., and a modern reproduction of the kind is to be seen at Holyrood Palace, Edinburgh. Drinking F.s. for wayfarers, as well as horses and other animals, are commonly placed in streets and public resorts, and the Metro-

politan Drinking Fountain Association was formed in London in 1859.

Fountain Pen. Ingenious contrivance so arranged that the penholder is a hollow shaft, and serves as a reservoir for ink, releasing it at a sufficiently rapid rate to maintain a steady flow, no matter at what speed it may be used. At first the difficulty of producing a pen that was always fluent for varying rates of speed, but capable of retaining ink, without leakage, when not in use, was not easily overcome, but a workable feed was ultimately evolved, the principle of which is, that air can only be admitted to release the ink and cause it to flow as the tiny sub-reservoirs around the nib become empty. For a long time most pens needed to be charged with ink by means of an independent filler, but later an india-rubber bag was made, on which a bar, raised or depressed by means of a lever, filled or expelled the ink as required. The more recent leverless type is filled and emptied by turning a knurled knob at the top of the barrel.

Fountains Abbey, Cistercian abbey of W. Riding of Yorkshire, England, 3 m. from Ripon, founded in 1132, and famous as one of England's most glorious antq. monuments. F. A. shows a mellow blending of the Transitional, Early Eng., and Perpendicular styles, and it is not difficult to imagine what it looked like in its heyday. Save for being roofless, the great church, its towers set, curiously, at the end of the N. transept, seems at first sight to be complete, with its long narrow nave, plain and unadorned in conformity with the Cistercian austerity; its chancel enlarged and rebuilt in the thirteenth century; and its beautiful chapel of the Nine Altars or E. transept, which no doubt inspired its only Eng. counterpart at the cathedral of Durham. The 'great cloisters' vaulted with two aisles and 300 ft. in length, or more properly the cellarium, is a unique feature of the ruins; there are a refectory and a chapter house, in which latter were interred the remains of nineteen abbots.

In Aug. 1916 it was announced that the abbey, together with Fountains Hall and 60 ac. of land bounded by the original abbey walls, was being sold to a group of leading Rom. Catholics, including the duke of Norfolk, who proposed to restore the abbey and use it as a Benedictine monastic house, and as an international memorial to all Rom. Catholics who were killed in the two World Wars. The announcement gave rise to some controversy, it being regarded by some as highly debatable whether or not a building of the architectural and artistic stature of F. A. was a fit subject for such a revival. For F. A. has been described as 'the crown and glory of all that monasticism has left us in England.' For four centuries it flourished as the greatest Cistercian house in England, and even in its ruined state enables us to recover, better than any other remains of the kind in England, the plan and arrangement of a large Cistercian monastery. F. A., or the abbey of the Blessed Virgin Mary at

Fountains, originated in a revolt of some monks against the laxity of discipline and worldly tendencies that prevailed at the Benedictine abbey of St. Mary's, York, and in their determination to withdraw from this abbey. This they did in 1132, and were provided by Archbishop Thurstan of York with a dwelling place at Fountains. Very early the monks had applied for admission to the Cistercian order, and this being granted, Fountains became the spiritual daughter of

member to member of the family, eventually passing to Commander Clare Vyner, the owner, in 1946. See F. A. Hodges, *Fountain's Abbey*, 1904, and C. C. Bell, *The Story of Fountain's Abbey*, 1932.

Fouqué, Friedrich Heinrich Karl de la Motte (1777-1843), German writer, novelist, and poet of the Romantic movement, b. at Brandenburg. Between 1810 and 1815 F.'s popularity was at its height, and he wrote numerous novels, romances, plays,



John H. Stone

FOUNTAINS ABBEY

Clairvaux in Champagne at that time governed by St. Bernard. The little community lived peacefully for years but later three monks of York (Hugh the dean, and Serlo and Iost) came to the monastery and bestowed their wealth upon it. Other benefactors followed, and participation in the medieval wool trade brought enormous wealth to the foundation. In 1539 the abbey was surrendered to Henry VIII, who sold the whole estate to Sir Richard Gresham, whose son, the founder of the Royal Exchange, broke the estate up, and sold the abbey to Sir Stephen Proctor. The latter used stones from the ruins of the abbey's house to build Fountains Hall, ruining himself in the process. After many alienations the abbey and hall passed in 1768 to the Alabasters, ancestors of the earls of Gray and marquesses of Ripon and, for more than 150 years the abbey descended from

ind. epics. The earliest and best known of his works is *Undine*, a classic of romance which appeared in 1811, and is the work by which his memory now lives. Amongst other pubs may be mentioned *Der Fauberring* (1913) and *Die Jäger* (1915). See Léonie, *Fouqué als Erzähler*, 1910, J. Haupt, *Elementargespräch bei Fouqué*, *Immann und Hoffmann*, 1923, and life by J. Reinhard, 1926.

Fouquet (or Fouquet), Jean (c. 1415-c. 1455), French painter, miniaturist, illuminator, and painter to Louis XI. His miniatures rival those of Clovis and Attavanti. His famous portrait of Charles VII dates from 1442. About 1448 he painted the miniature illustrating *Le Cas des nobles hommes et femmes*, from the Lat. of Boccaccio (later in Royal Library, Munich). Portions of the famous Book of Hours are in the Brenetano-Laroche

collection at Frankfort. The Antwerp gallery contains his 'Virgin and Child' (tradition says that the Virgin is a portrait of Agnes Sorel). In 1461 F. painted forty miniatures for Etienne Chevalier, Charles VII.'s treasurer. He united the manner of Van Eyck with the It. style, and influenced contemporary painters largely. See writings of Count Léon de La Horde, Brentano, Count de Bastard; G. Lafestre, *Jean Fouquet*, 1905; P. Durrieu, *Jean Fouquet*, 1908; and P. Wochoer, *Jean Fouquet and his Time*, 1948.

Fouquet (or Foucquet), Nicolas, Viscount de Melun et de Vaux, Marquis de Belle-Isle (1615-80), superintendent of finance in France under Louis XIV., b. in Paris, the son of a Fr. nobleman in the confidence of Richelieu. In 1650, through the influence of Mazarin, he was given the important position of procureur-général to the parliament of Paris. As minister of finance, F.'s fortune, largely acquired by fraudulent operations, surpassed even Mazarin's, and the latter's successor, Colbert, who was instructed to inquire into the state of the finances, secretly influenced the king against F. He was finally arrested at Nantes and charged with malfeasance in office to the king's detriment, and sentenced to imprisonment for life. See P. A. Cheruel, *Mémoires sur la vie publique et privée de Fouquet*, 1862; J. Lair, *Nicolas Fouquet*, 1890; and E. Latoy, *Qui était le masque de fer?*, 1931.

Fouquier-Tinville, Antoine Quentin, (1748-95), Fr. revolutionist, the public accuser of the tribunal during the Reign of Terror, b. at Hérouel, Aisne. Hero, for a time, he practised law, and then came to Paris, where he turned spy. He was one of the fiercest of democrats on the outbreak of the revolution, and his activity earned him the reputation of one of the most terrible and sinister figures of the revolution. As public accuser, he was as ruthless as Robespierre himself. With the fall of Robespierre and the Terrorists his career came to an end, and he was brought to trial, condemned to death, and guillotined in May 1795. See G. Leccocq, *Notes et documents sur Fouquier-Tinville*, 1885; A. Dunoyer, *Fouquier-Tinville, accusateur public du tribunal révolutionnaire*, 1913; and J. W. Barwisch, *Fouquier-Tinville*, 1941.

Fourchambault, tn. of France, in the dept. of Nièvre, situated on the Loire 44 m. N.W. of Nevers. It is noted for its mineral springs, and has important iron and steel works, with manuf. of nails and wire. Pop. 5000.

Fourcroy, Antoine François, Comte de (1755-1809), Fr. chemist, and the son of a druggist, b. in Paris. He was one of the earliest converts of Lavoisier's theories, in conjunction with whom, together with Berthollet and De Morveau, he prepared the *Méthode de nomenclature chimique* (1787). He organised the Ecole Polytechnique, and instituted schools of medicine. In 1801, under Napoleon, he became director-general of public instruction. The Royal Society's *Catalogue of Scientific Papers* enumerates fifty-nine memoirs by F.

Four Freedoms, peace objectives enunciated by President Franklin Roosevelt at a period in the Second World War when the U.S. Govt. while not yet at war, was playing a by no means negligible part in the 'white' warfare of diplomacy in pursuit of its two major aims: defence of the W. hemisphere at a distance, and support for the free values of the W. This diplomatic warfare was intensified by the Nazi efforts to persuade the Russians, with whom they were still outwardly on friendly terms, that Stalin had been classified by President Roosevelt with the Axis dictators. In his annual message to Congress of Jan. 6, 1941, President Roosevelt answered the Nazi peace drive in relation, especially, to Hitler's real intentions towards Russia, by repudiating a 'peace dictated by aggressors and sponsored by appeasers,' and set forth his famous 'four freedoms' — freedom of speech, of worship, from economic want, and from aggression. He thus offered a basis for the kind of world worth striving for after the war. But the basis was too generalised, having the disadvantage, in addition, of being unilateral, like Wilson's Fourteen Points; and further, the F. F. had been launched in a message to Congress. They therefore bound nobody but their authors. When President Wilson undertook to negotiate with Prince Max of Baden for a truce on the basis of his Fourteen Points, they still, strictly speaking, bound no one else, Wilson not having thought it necessary to gain the sanction of Lloyd George and Clemenceau, an oversight that by no means eased his tasks at the Paris Conference. Roosevelt wished to avoid so obvious a pitfall and envisaged an agreement with the Brit. on broad political and economic principles while America was still at peace and, above all, he wished to commit the Brit. grimly fighting for survival, to a post-war programme. Whence the negotiations in Aug. (1941) between President Roosevelt, Mr. Sumner Welles (foreign affairs), and Mr. Harry Hopkins (q.v.) on the one hand, and Mr. Winston Churchill and Sir Alexander Cadogan (permanent under-secretary of state for foreign affairs) on the other, for the Atlantic Charter, which incorporated (*inter alia*) the substance of the F. F. See ATLANTIC CHARTER; ROOSEVELT, FRANKLIN DELANO.

Fourier, François Marie Charles (1772-1837), Fr. socialist writer, b. at Besançon. He was educated at the college in his native tn. and then travelled in France, Germany, and Holland. He inherited a considerable sum of money on his father's death, but this he subsequently lost at the siege of Lyons, all his property, in which he had invested his inheritance, being destroyed. He then entered the army, but was discharged on account of ill-health. He afterwards turned his attention to mercantile pursuits, and obtained sufficient by this means to satisfy his wants, and devote his leisure time to the elaboration of his first work on the organisation of society. This is entitled *Théorie des quatre mouvements et des destinées générales* (1808). This work

contains his whole system, and was later republished under the title *Théorie de l'unité universelle* (1841), and *Le Nouveau Monde industriel, ou invention du procédé d'industrie attrayante et combinée distribuée en séries passionnées* (1829-30). *Le Nouveau Monde industriel* is probably the most finished exposition of F.'s views, and on its pub. in 1830 he began to attract some attention, adherents gathering round him.

F.'s system was partly one of co-operation, partly of Socialism. His scheme was that, what he named a phalanstery (from the word phalanx), consisting of about 400 families, should live together, combining their labour, upon a dist. of about a square league in area. The buying and selling transactions necessary for the support of the community were to be controlled by one person, so as to avoid chaffering. If any member brought capital with him it was not confiscated, and he was paid interest on it. Profits of labour were apportioned on a system which first allowed subsistence money for every member of the community, including those who were incapable of labour. The rest of the profits were then divided in agreed proportions, to remunerate labour and skill or talent, and to pay interest on the capital received. The individual recipients of these shares of the profits could spend the money as they pleased. In 1852 an attempt was made to found an industrial colony on F.'s plan, but it was not successful. His complete works were pub. 1841-48. See C. Pellarin, *Fourier, sa vie et sa théorie* (5th ed.), 1872; W. Sargent, *Social Innovators*, 1859; M. R. Reybaud, *Reformateurs modernes*, 1843; V. Considérant, *Exposition abrégée du système de Fourier*, 1845; Transon, *Théorie sociétaria de Charles Fourier*, 1832; A. Bebel, *Charles Fourier*, 1888; Samir, *Le Socialisme de Fourier*, 1900; H. Bourgin, *Fouries, contribution à l'étude de socialisme français*, 1905; and W. Wessels, *Charles Fourier als Vorläufer der modernen Genossenschaftsbewegung*, 1929.

Fourier, Jean Baptiste Joseph (1768-1830), famous Fr. mathematician, b. at Auxerre, was educated at the military school in his native tn. and afterwards taught mathematics in the same institution. In 1795 he became prof. in the Ecole Normale at Paris, which he shortly left for the Polytechnique. In 1798 he accompanied Bonaparte to Egypt, and took a prominent part in the gov. He returned to France in 1801, became prefect of Isère, holding that office until the return of Bonaparte from Ella, when he was dismissed. In 1811 he was elected to the Académie des Sciences, and in 1826 was admitted member of the Fr. Academy. F. was a voluminous and versatile writer. His chief interest was mathematics and mathematical physics, but he entered into the public life of the time with an enlightened enthusiasm. On his return from Egypt he contributed to the *Description de l'Egypte*. In 1822 he pub. *La Théorie analytique de la chaleur*, which had formed part of a thesis awarded a prize by the Académie des Sciences in

1812. *Analyse des équations indéterminées* was pub. in 1831, after his death. A collected ed. of his works was pub. in 1889-90. F. is best remembered for his development of the series which bears his name, and which has subsequently become of basic importance in the development of the theory of physics, especially wave motion and heat radiation. The general form of the series is that of the representation of the function of a variable between fixed limits by a series of sines or cosines, as

$$a_0 \sin \frac{n\pi x}{l} + a_1 \sin \frac{2\pi x}{l} + \dots + a_n \sin \frac{n\pi x}{l} \\ + \dots \text{ and } b_0 + b_1 \cos \frac{\pi x}{l} + b_2 \cos \frac{2\pi x}{l} \\ + \dots + b_n \cos \frac{n\pi x}{l} + \dots$$

where the limits are 0 and l . The investigation and criticism of the series were continued by such mathematicians as Dirichlet, Riemann, Cantor, Lebesgue.

Four Lakes, chain of lakes situated in co. Dane, Wisconsin, U.S.A. They are connected by short canals, and upon an isthmus between the lakes Mendota and Monona is the city of Madison, which is the cap. of the state.

Fournies, tn. of France, in the dept. of Nord, and the arron. of Avesnes, situated on a trib. of the R. Sambre, 40 m. S.E. of Valenciennes. It is an important industrial centre; wool combing and spinning are largely carried on, and cloth is manufactured. There are ironworks, forges and foundries, and glass factories. Pop. 12,600.

Fournier, Henri Alain (Alain-Fournier) (1886-1914), Fr. novelist, b. at Cher, was educated at Brest and later at the Lycée Lykanal, near Paris. He spent two years in military service, followed journalism, and in 1913 pub. *Le Grand Meaulnes* (trans. 1948), his only completed novel, and the basis of his reputation. It is a romantic novel, with an underlying suggestion of deeper significance, and the basic idea is symbolist in character. Fragments of his *Colombe Blanchet* were pub. (1922), and *Miracles* (1924). See T. Rivière, *Introduction to Miracles*, 1921; H. Ellis, *From Rousseau to Proust*, 1935; and H. Peyre, *Hommes et œuvres du XX^e siècle*, 1938.

Foursome Reel, see under REEL

Fourteen Points. Code of allied war aims set forth by President Woodrow Wilson before Congress on Jan. 8, 1918; which for clarity and liberality was in marked contrast to the vagueness and reactionary character of the ideals of the professional diplomats of 'the balance of power.' The F. P. were instrumental at a critical period in rallying the spirits of many of the oppressed nationalities of central Europe. The points were (1) open covenants of peace and no secret diplomacy; (2) freedom of navigation in peace and war outside territorial waters, except where seas may be closed by international action; (3) removal of economic barriers; (4) adequate guarantees for reduction of armaments; (5) an absolutely impartial adjustment of all colonial claims, the

interests of the peoples concerned having equal weight with the equitable claim of the gov. whose title is to be determined; (6) all Russian ter. to be evacuated and Russia to be given full opportunity for self-development with the aid of the powers; (7) complete evacuation of Belgium and restoration of Belgium without any limit to Belgian sovereignty; (8) all Fr. ter. to be freed, invaded portions to be restored, and the wrong by Prussia in regard to Alsace-Lorraine to be righted; (9) It. frontiers to be adjusted on lines of nationality; (10) peoples of Austria-Hungary to be given an opportunity of autonomous development; (11) Rumania, Serbia, and Montenegro to be evacuated, Serbia to have access to the sea, and the relations of the Balkan States to be settled on lines of allegiance and nationality under international guarantees; (12) non-Turkish nationalities of the Ottoman empire to be assured of autonomous development and the Dardanelles to be free to all ships; (13) Polish independence to be restored, the independent state to include ter. inhabited by indisputably Polish pops., and to have access to the sea; (14) a general association of nations to be formed under specific covenants to afford mutual guarantees of political independence and territorial integrity to both great and small states. In Oct. 1918 numerous diplomatic notes were exchanged between Germany and the U.S.A., at a time when the Ger. Gov. realised that their military forces were doomed to defeat, in which Germany endeavoured to obtain some modification of this 'charter of allied aims,' but were gradually brought to realise that Wilson would only recommend a cessation of hostilities on condition of unreserved acceptance by Germany of the F. P. The trans. into practical politics of the celebrated F. P. imposed difficulties on the most experienced diplomats and statesmen, trained as were the majority in an atmosphere foreign to the idealism of this code. But at the very opening of the Versailles Treaty figured the creation of the League of Nations bound together by covenant; and much after that time was accomplished in the matter of the reduction of armaments though, ultimately, Germany under the Nazi regime nullified the whole policy of disarmament; while the map of Europe was remade on lines which appeared to conform as far as practicable to the principle of self-determination. In this last-mentioned respect Nazi Germany defied the principle of self-determination by seizing Austria, Czechoslovakia, Danzig, and half of Poland. Points one (so far as secret diplomacy was concerned), three, four, five, and nine have never been implemented. The remaining points, except in certain particulars, and in respect of proposed international guarantees, were more or less fulfilled, being embodied in the ill-fated Covenant of the League of Nations. Nazi propagandists emphasised the non-fulfilment of some points, particularly disarmament, by way of justifying Ger. rearmament and their violation of the peace

treaties. See also COVENANT; EUROPE; PEACE CONFERENCE (1919); VERSAILLES, TREATY OF. See R. S. Baker, *Woodrow Wilson and World Settlement*, 1922; and W. Lippmann, *U.S. War Aims*, 1944.

Fourteenth Army. largest single army of Second World War. It held the longest battle-line in the war—from the bay of Bengal northwards to where India and Burma border on China. In 1941 and 1945 the F. A. was about 1,000,000 strong (including all its ancillary formations), and just before the fall of Rangoon it had 500,000 fighting men at its disposal. The divs. that served with it were 2nd and 36th Brit.; 3rd Indian (the Chindits), and the 5th, 7th, 17th, 19th, 20th, 23rd, 25th, and 26th Indian; 11th E. African, and the 81st and 82nd W. African. One-third of each Indian div. consisted of Brit. troops and the African divs. had Brit. officers and N.C.O.s. The army was grouped into three corps: the 4th, 15th, and 33rd Indian Corps. Later the 15th Corps was detached from the F. A. for the 1945 Arakan and Rangoon offensives more. A fourth corps—the 34th—was formed for the invasion of Malaya. The F. A. was the army which broke the myth of Jap. invincibility on land; which denied the enemy the road to India, and finally threw him back in two great thrusts—from Kohima to Mandalay and from Mandalay to Rangoon. Its victory was not only over the Jap., but over the terrain, the Jungles, and the climate. Until Mandalay was passed there were no roads, save those they built themselves, no railways, and few tns. It was the first army to plan and execute the movement of whole infantry divs. by air. It was the only army in the war to develop air supply to the extent of maintaining its front-line troops entirely by air; and from the time of crossing the Chindwin to the fall of Rangoon the whole campaign was based on air supply, which reached a rate of 3000 tons a day. Lt.-Gen. (later Gen., and F.M.) Sir Wm. Slim commanded the F. A. from its formation until just before the Jap. surrender. In its last ten months of operations the F. A. covered more than 1000 m. See also BURMA, SECOND WORLD WAR CAMPAIGNS IN.

Fourth Estate. Edmund Burke, in alluding to the three estates of the realm, viz. lords, clergy, and commons, constituting the Brit. Parliament, termed the public press the F. E., by reason of the enormous influence journalism exerts over both imperial and domestic affairs.

Fourth Party. name applied to a small opposition group within the Eng. Conservative party about 1880, under the leadership of Lord Randolph Churchill in the House of Commons. He had active coadjutors in Sir Henry Drummond Wolff and Sir John Gorst, and occasionally received the assistance of Mr. A. J. (later, Earl) Balfour. The F. P. made itself conspicuous in 1880 and the succeeding years by its vigorous attacks upon the recognised leaders of both parties. See W. Churchill, *Life of Lord Randolph Churchill*, 1906; and H. E. Gorst, *The Fourth Party*, 1905.

Four-year Plans, German, for economic development, prepared in imitation of the Soviet's five-year plans (q.v.). The first (1933-36), announced by Hitler, was, ostensibly, a limited plan of road construction and public works, but was soon superseded by a huge rearmament programme, which rapidly absorbed all Germany's unemployed. The next plan (1937-40) covered the development of *Ersatz* (substitute) industries designed to make Germany self-sufficient. The chief of these industries were those for distilling oil from coal, the manuf. of artificial textiles, and the exploitation of indigenous ore reserves. This plan, too, was accompanied by continued rearmament, and it was still in progress when war broke out (1939), Germany having failed to attain self-sufficiency in any sphere. Oil production had reached only one-third of Germany's peacetime requirements, iron ore and artificial fibre about 20 to 25 per cent, base metal ores 15 per cent, and fats about 50 per cent.

Foussel Oil, see FUSFL

Foussa, see FORQA

Foutas Djallon see FUTA-DJALON

Fowey, par. and tn of Cornwall, Eng-
land, situated on the R. Fowey, 28 m
S.W. of Devonport, and 280 m from
London. In early times it was an im-
portant seaport, and ships for the crusades
were fitted out here. In the reign of
Edward III the tn equipped a fleet of
forty-seven vessels, and about 800 men
for the siege of Calais. The inhab. were
in later times convicted of piracy,
and were deprived of their vessels. Queen
Victoria and the Prince Consort visited
the tn in 1846. The prin. industry is
pilchard fishing, and there is a deep and
sheltered harbour. The chief exports are
china stone and iron ore. There is a
coastguard and lifeboat station. Pop.
2300. See W. Macarthur, *The River
Fowey*, 1918.

Fowl, see POULTRY

Fowler, Henry Watson (1857-1933), Eng. lexicographer and linguist, son of the Rev. Robert F. of Tunbridge Wells. Educated at Rugby school and Balliol College, Oxford. Assistant master at Sedbergh School, 1892-99. In 1905 he produced, in collaboration with his brother F. G. F., a trans. of Lucian, which was pub. by the Oxford Univ. Press. The following year the brothers brought out *The King's English*, which was most successful. They were then commissioned by the Oxford Univ. Press to prepare an abridgment of the *Oxford Dictionary*, which was pub. in 1911 as *The Concise Oxford Dictionary*. Both brothers served with the B.R.F. in the First World War, F. G. F. losing his life. F. then finished alone the *Pocket Oxford Dictionary*, which they had begun in collaboration. The work by which F. will, perhaps, be chiefly remembered is his *Dictionary of Modern English Usage* (1926)—highly original in treatment, and valuable as an aid to correct expression in Eng. This was followed in 1929 by the second ed. of *The Concise Oxford Dictionary*, embodying changes in the lan-

guages since 1911—the purpose of the work from the first being to 'present as vivid a picture as the small dictionary could be made to give of the English that was being spoken and written at the time.' He also prepared much of the third ed. (1934), which was pub. with a supplement by H. G. Le Mesurier shortly after his death. His various linguistic speculations appeared in the pubs. of the Society for Pure English. Other pubs. *If Wishes were Horses* (1929); and *Some Comparative Values* (1929).

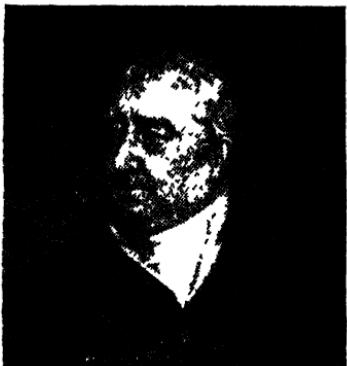
Fowler, John (1826-64), b. at Melksham in Wiltshire. An Eng. inventor, chiefly famous for his steam plough, in which the plough is moved by fraction of a stationary engine. This was first employed with satisfactory results in 1850 in the drainage of Hainault Forest in Essex. F. was also the inventor of other improved agric. machines.

Fowler, Thomas (1832-1904), Eng. philosopher, b. in Lincolnshire. He received his education at King William's College, Isle of Man, and at Merton College, Oxford, where he graduated in 1854. In 1881 he was elected president of Corpus Christi College, which position he filled till his death, and from 1873 to 1888 he was prof. of logic at Oxford. From 1899 to 1901 he was vice chancellor of the univ. of Oxford. His pubs. include *The Elements of Deductive Logic* (1867, 1892), *The Elements of Inductive Logic* (1870, 1901), *Baron's Novum Organum* (1878, 1889), *Tocke* (in Eng. Men of Letters, 1880), *Francis Bacon* (1841), *Progressive Morality: an Essay in Ethics* (1905), *History of Corpus Christi College* (1909).

Fowling, hunting and catching of birds and wild fowl generally, viz. swans, geese, and the different varieties of ducks—canas-backs, reuleads, mallards, teal, pintail, and wood ducks, etc. F. is performed in a variety of ways, such as by concealment of the hunter, by decoy, or occasionally, in some parts, by the training of dogs and of ponies to attract the birds. See also WILD FOWL.

Fox, Charles James (1749-1806), Eng. statesman, third son of Henry F., first Baron Holland, was one of the most popular men of his day and one of the most charming of any age. As a lad, encouraged by his father who desired to make a man of him, to ape the vices of those older than himself, he became a heavy drinker and a reckless gambler. At cards and dice he lost a great fortune, but Lord Holland and his friends always came to his rescue, although on one occasion before assistance was forthcoming his furniture was sold for the benefit of his creditors. In later life, however, the gaming table had less attraction for him. F. entered Parliament when he was in his twenty-first year, and after he attained his majority he was made by Lord North a lord of the Admiralty, which office he held only until 1772, when he resigned in order to be at liberty to oppose the Royal Marriage Act. He proved himself so excellent a debater that North persuaded him to rejoin the ministry at the end of the year as a lord of the Treasury, but his

independence was so marked that the king insisted upon his dismissal. In opposition he attacked vigorously the ministerial policy which cost England the U.S.A. In 1782 he became foreign secretary under Rockingham, but on the death of his chief refused to serve under Shelburne. In the following year he formed a coalition with North, becoming joint secretary of state with him under the duke of Portland, but was dismissed in Dec., when, by the king's intervention, his India Bill was thrown out. The king, who disapproved of F.'s opinions and resented his friendship with and his influence over the Prince of Wales, was determined never again to let him take office, and he managed to exclude him from the Coalition ministry of 1804, but two years



CHARLES JAMES FOX

later, when Grenville became Prime Minister, had to accept him as foreign secretary. Thus, by the irony of fate, F., who had been in opposition for more than twenty-three years, d. in office. He d. on Sept. 13, aged fifty-seven, and was buried in Westminster Abbey, close by his great opponent, Pitt, who had pre-deceased him by a few months. F. had little or no opportunity to show what ability he possessed as a constructive statesman, but as a leader of opposition he proved himself the right man in the right place. His readiness in reply, his power of speaking at any time and on any subject, made him invaluable to his party, and his eloquence was always a thorn in the side of the ministry. His personal popularity kept his party together, though his approval of the Fr. Revolution caused a political and personal breach between him and Burke, who could see no good in it. F. was an ardent Whig, and had a healthy passion for opposing all abuses and restrictions of the liberty of the subject. Only shortly before his death he brought in a measure to abolish the slave trade. F. was one of the two men of his century who may be described as founders of Brit. Liberalism—the other being Burke. In the hour of their separa-

tion F. described in broken sentences the debt he owed to Burke's inspiration. Burke had found the Whigs a world of selfish nobles who cared only for the spoils of office, and had created a new Whig party with principles and ideals, and F. soon fell under his spell. He became Burke's chief ally in the battle for justice to the Amer. colonies, justice to Ireland, justice to India, and for the estab. of effective parl. gov. As the advocate of Burke's large ideas F. rapidly made himself the leading popular politician in England. But the great fund of prestige and popularity that he won during his struggle against the king and Lord North during the Amer. war he threw away by a series of sensational blunders. In these Burke, who had been his teacher, was closely associated, for Burke, like F., was a bad tactician, and had a headstrong and wilful nature. Each of them in his own way redeemed his mistakes, Burke by the literary power which found in the Fr. Revolution a magnificent theme, and F. by the courage and debating strength that made him the most powerful and passionate champion of popular ideas and freedom at a time when class prejudice almost extinguished liberty in England. Few would say that F. was always well advised in his opposition to Pitt during the Fr. wars. But whatever view is taken of his actions, or of the inevitability of the Fr. wars, few can doubt that it was well that a man of his position should have resisted the campaign of domestic repression that set in when the war began and lasted for more than twenty years; and in this way F.'s conduct during the Napoleonic wars served the cause of national unity, though it might seem at the time so adverse to it. See Lord John Russell, *Life and Times of Charles James Fox*, 1859–66; Sir G. O. Trevelyan, *Early History of Charles James Fox*, 1880; J. L. Hammond, *Charles James Fox, a Political Study*, 1903; J. Drinkwater, *C. J. Fox*, 1928; and C. Hohhouse, *Fox*, 1934, 1948 (with an essay by H. Nicolson).

Fox, George (1624–91), founder of the Society of Friends or Quakers. He was b. in Fenny Drayton, Leicestershire, and was the son of a weaver, Christopher F. At an early age he was apprenticed to a shoemaker, who also traded in cattle and wool. He was of a spiritual disposition, and while tending the sheep was occupied in holy meditation. At the age of nineteen he felt he had a divine call, and in consequence left his home and friends and 'brake off all familiarity or fellowship with old or young.' For the following four years he wandered about the country, with Bible in hand, attending meetings, conversing with 'professors,' and publicly expressing his disapproval of 'steeple-houses,' church bells, and all kinds of formalism, religious and social. About 1646–47 he began to realise an inner light in his heart, which appeared to him to be a divine revelation. He not infrequently interrupted services when the preacher was teaching doctrines which seemed to him erroneous, and in 1649 he was imprisoned at Nottingham for so doing. In

the following year he was again imprisoned in Derby on a charge of blasphemy, and on his release walked barefoot through Lichfield, cursing the town with the words, 'Woo to the bloody city of Lichfield.' Between the years 1653 and 1673 he was imprisoned on six different occasions. During his whole life, in fact, he was continually subjected to persecutions. He gathered together a faithful band of followers, of whom there were, in 1656, nearly a thousand in jail. In manner and speech they separated themselves from their fellows, saying 'thee' and 'thou' to all men and women without any respect to rich or poor.' They interpreted Christ's words literally, and thus opposed war and the taking of oaths, and advocated poor relief and self-help. F. also taught that the sacraments of the Lord's Supper and baptism were not essential, and that there was no need for an ordained or paid ministry. He visited Barbados, Jamaica, and America in 1671, and Holland in 1677 and 1684. His Journal, ed. by Thomas Ellwood, F.'s literary executor, and other friends, was pub. in 1694, and *The Short Journal and Itinerary Journals of George Fox*, ed. from MS. by N. Penney in 1923. The complete list of his writings occupies fifty-three pages of Joseph Smith's *Descriptive Catalogue of Friends' Books*, 1863. See S. M. Janney, *Life of George Fox*, 1853; J. S. Rowntree, *The Life and Character of George Fox*, 1891; T. Hodgkin, *George Fox*, 1896; D. Butler, *George Fox in Scotland*, 1913; H. Knight, *The Founder of Quakerism, a Psychological Study*, 1922; and E. Taylor, *The Valiant Sixty*, 1917.

Fox, Henry, and Henry Richard Vassall, see HOLLAND, BISHOP.

Fox, or Foxe, Richard (c. 1418-1523), bishop and statesman, b. at Ropescleve; educated at Oxford. He was a trusted adviser of Henry VII., and held the post of secretary of state, privy seal, bishop of Exeter (1487), of Bath and Wells (1492-1494), of Durham (1494-1501), and of Winchester, besides performing many diplomatic missions. In 1516 he retired from court and founded Corpus Christi College, Oxford.

Fox (Dutch *fok*; Ger. *fuchs*), name properly applicable only to the British representative of the family *Canidae*, but now used to include many other species. The feminine form, 'vixen,' represents the O.E. *fyrn* (*fox* plus the feminine termination *-en*). The genus F. (*Vulpes*) is distinct from the genus *Canis* by the shorter build, the long and bushy tail, and the large ears of the members of the former. Also the projection behind the eye-socket has its upper surface concave, with a raised ridge, instead of regularly convex as in the genus *Canis*, and there is not a hollow chamber within the frontal bone of the forehead. The range of the F. extends eastwards across Europe to Japan, and to the S. across N. Africa, Persia, N.W. India, and the N. Amer. side of the Atlantic. Naturally over such an area many local differences are found, and the red F. of N.W. Europe differs considerably from the white-footed

F. of Persia and Arabia, whilst both are in many respects dissimilar to the black F. of N. America. Among other species may be mentioned the Himalayan F. (*Vulpes montanus*), the Tibetan F. (*V. ferrilatus*), the Alaskan F. (*V. harrimanii*), the largest species, the Indian F. (*V. bengalensis*), the *V. famineus* or *egyptiacus* of Egypt, the Arctic F. (*Alopex lagopus*), etc. The



ENGLISH FOX

Amer. grey F. (*Urocyon cinereo-argentatus*) is a separate sub-genus of *Canis*, whilst the long-eared F. of S. and E. Africa (*Otocyon megalotis*) forms a distinct genus. The skins of many varieties of the F. are valuable, and are largely imported into this country for furs. The cunning of the Eng. F., which owes its survival to the sport of fox-hunting, is well known. The vixen brings forth a litter of from five to eight cubs in April, the period of gestation being forty to sixty-five days. The cubs take eighteen months to grow to their full size and strength; the average life of the F. is about thirteen years.

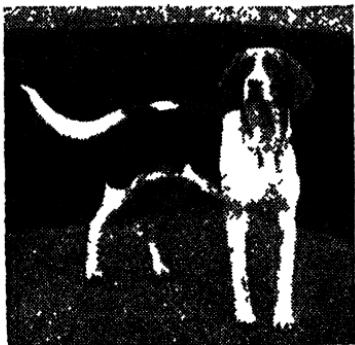
Fox-bat, see FRUIT BAT.

Foxe, John (1516-87), Eng. martyrologist, b. at Boston, Lincolnshire. He entered the univ. of Oxford, taking both the bachelor's and master's degrees in 1537 and 1543 respectively, being elected a full fellow of Magdalen College in 1539. He applied himself assiduously to the study of theology, and became a convert to the principles of the reformation in 1545, resigning his fellowship in consequence. He then went abroad and gained a livelihood as corrector of the press for an eminent printer at Basle. In the reign of Elizabeth he returned to England and came under the notice of the duchess of Richmond, through whose influence he eventually obtained employment as tutor to the children of her brother, the earl of Surrey. In 1559 F. was ordained deacon by Ridley, bishop of London, and began preaching the doctrines of the reformation. He was ordained priest in 1560, and three years later was made a prebendary in Salisbury Cathedral by the influence of Cecil. He held successively the livings of Shipton and Cripplegate, but soon re-

signed these, and for a year held a stall at Durham. The work that has immortalised F.'s name is his *History of the Acts and Monuments of the Church* (1563), known as *Foxe's Book of Martyrs*, on which, however, reliance for historical accuracy may not be placed. The Lat. ed. was printed in 1559. The first Eng. ed. appeared in 1563, and it has since gone through innumerable eds., the best ones being by S. R. Cuttley, (1837-41), and J. Pratt, and J. Stoughon (1877). Besides this F. wrote numerous controversial and other works. F. d. in London, and was buried in the chancel of St. Giles's, Cripplegate. See W. Winter, *Biographical Notes on John Foxe*, 1876.

Foxglove, genus of hardy biennial or perennial plants of the order Scrophulariaceae and genus *Digitalis*. Only one, *D. purpurea*, is a native of Great Britain; it is a stately plant, bearing spikes of drooping, thimble-shaped pink flowers, spotted inside. A number of other species were introduced from W. Asia and S. Europe. Their flowers are purple, white, yellow, brown, or pink. The large wrinkled leaves yield digitalin and other active principles useful as heart tonics and sedatives. See *DIGITALIS*.

Foxhound, small hound (especially trained for fox-hunting). It has been most carefully bred and reared for over 300 years: it is a combination of the old S. hound, with its keen nose, and a greyhound, with its swift foot. It possesses great staying powers, and is often used to work in thick coverts or run across open fields for 10 hrs. at a stretch. Fs. are



FOXHOUND

1 Fall

hunted in packs, generally dogs and bitches separately. The dogs stand 24 in. at the shoulder, and the bitches 20 or 21 in. The puppies are entered at cub-hunting in company with older hounds, so that, in being trained for hunting, their natural faults may be quickly cured. In many packs it is still the custom to 'round' the dog's ears at about four months old, so that there may be less likelihood of their getting torn in brushwood. The hounds

are annually drafted to make room for the puppies. The chief points of a F. are as follows: Head large and full, with a girth in front of the ears of at least 16 in.; ears set low, close to the head; nose, with wide-open nostrils, should measure 4½ in.; neck free from all throatiness; shoulders long, muscular, and well-sloped; back short and strong; loins square, with a slight arch; legs absolutely straight and very strong; feet round and cat-like, with good strong pads; hind quarters strong, straight stiles preferred; stern, arched over the back, hairy below, and tapering to the end; coat short, thick, and glossy; colour not very important, and varying between black, white, and tan, black and white, and pied with hare, badger, tan, or yellow.

Fox-hunting, as practised at the present time, is not of very great antiquity. Foxes existed in this country from early times, and they were hunted in the days of Edward I., but such hunting was as different from F. proper as light from dark. Wm. the Twin, who was head huntsman to Edward II., mentions the fox as belonging to the inferior class of animals that should be exterminated by any means, and again in the *Records of the Chase*, written in the time of Edward III., the fox is named with contumely. In those times Reynard was pursued with no ceremony or method, but caught in nets, or shot, or dug up from his earth and slaughtered at every possible opportunity. Such views prevailed until the eighteenth century, when F. began to take its place as a sport. It is not possible to say with exactitude when the first pack of hounds was maintained in England entirely for F., but the following facts throw some light on the matter. In a letter from one of his descendants, it is stated that Lord Arundale, between 1690 and 1700, kept a pack of fox-hounds which were maintained in the family until they became the property of Hugh Maynell in 1782. The *Field* of Nov. 6, 1875, describes a horn, which later became the property of Thomas d'Ayenante, Esq. The inscription on this reads: 'Thomas Boothby, Esq., Tooley Park, Leicester. With this horn he hunted the first pack of foxhounds then in England for fifty-five years. Born 1677. Died 1752.' These statements are not conclusive, as the packs mentioned may not have hunted foxes exclusively, but they serve to indicate the probable truth of the statement in Lord Wilton's *Sports and Pastimes of England* (1868) that hounds began to be entered solely to fox about 1750. In the early days of F. the procedure was somewhat different from the present. The meet took place in the early hours of the morning, and the fox was traced by his 'drag,' that is, the line he had taken on his return from a foraging expedition on the previous night. The disadvantage of such a course was that a fox was very liable to be scared by the hounds on the drag scent, and make good his escape before they caught the real scent.

Now, owing to the decrease in woods, etc., it is considered the better way to find the fox in his kennel, and the hour of the

meet is retarded until about eleven in the forenoon. When the fox breaks away from the covert he is allowed to travel for some little distance before the alarm is given, in order that he may not retrace his steps into the covert. The rules which govern scent are as little understood to-day as ever. On some days when all things seem propitious the scent will fall, and vice versa. It is thought by some that the manner in which hounds come out of covert may be taken as an indication; if they dwell for some moments before settling to the line the scent is good, but if the scent be poor they will make all haste not to lose it. An easterly wind is probably the best for scent, in spite of the poet who sings of 'a southerly wind and a cloudy sky.' An extraordinary circumstance is that if the fox is coursed at any period of the run by a dog, the scent falls after that point. The most dreaded foe of the fox-hunter is of course frost. The hunting season proper begins in Nov.; but during part of Sept., the actual date of starting varying according to the time of harvest in different parts of the country, and during the whole of Oct. cub-hunting is carried on. The object of this is indicated by the name, to blood young hounds, and teach them their business. Cub-hunting is commenced in the early morning, about 7 a.m., and the fox is hunted by the drag. The size of packs naturally varies from very large estabs. in the Shires to small kennels in the N. of England. If a pack hunts for five days in the week, or possibly six, as some do, about seventy-five couples of hounds will be required; if four days are hunted, from fifty to sixty couples; or if only two days, from twenty-five to thirty couples. A new entr'y begins cub-hunting at the age of about eighteen months, and is then probably of the first class for three or four more seasons. Many hounds last longer than this, and it is recorded of 'Potentate,' a noted hound belonging to a duke of Bedford, that he hunted for eleven seasons. The pick of the hunting in this country is supposed to be in 'the Shires,' a somewhat arbitrary term, which conventionally means Leicestershire, Northamptonshire, and Rutlandshire, but does not exactly correspond with these. The packs which are considered the best are the Belvoir, the Cottesmore, the Quorn, and the Pylchley.

Despite various agitations and remonstrances, the sport of F. has not declined in popularity of recent years; but the active work of the National Society for the Abolition of Cruel Sports (101 Chandos House, Westminster, S.W.1) and the League against Cruel Sports (58 Maddox Street, Bond Street, W.) has forced the fox-hunting fraternity into forming a society called the Brit. Field Sports Protection Society. A Bill for the banning of blood sports, including F., was introduced by a private member in 1949, but met with no great support in the Commons so far as F. was concerned.

In 1940 there were 234 packs of hounds in the Brit. Is.—193 in England and Wales, 29 in Ireland, and 12 in Scotland.

As regards the cost of hunting, it may be taken as a rough estimate that for every day in the week that hounds hunt the cost per annum will be between £500 and £600; various local circumstances will influence the cost in each case, but it will not as a rule fall below £500. Any price may be given for hunters, from £30 to £800; sev. hundreds of horses, ranging in price from 200 guineas to 600 or 700 guineas, passing annually through the hands of Tattersall's in London and Warner Sheppard and Wade's in Leicester. If a man wishes to hunt regularly with a pack in the Shires, he must, of course, have a far greater estab. than a man who hunts in the N. The sums of money that are spent on hunting every year in this country in normal times are very large and many persons are employed in connection with the sport. The officials of a hunt comprise the master (M.F.H.), one or two 'whippers-in' and a kennel huntsman or 'feeder.' If the huntsman is an amateur, he is also invariably the master; if the master does not hunt his own hounds a paid huntsman is employed. In large packs two whippers-in are employed, but in some packs only one. The duties of whipper-in and kennel huntsman are often performed by one person, especially if the master hunts his own hounds. The kennel huntsman proper is the man who undertakes all responsibility connected with the hunt, save the actual hunting, walks out the pack, prepares the food for the pack that is hunting, etc. It was, however, the opinion of Lord Willoughby de Broke, one of the foremost authorities, that the man who hunts the hounds should also feed them. It is the first duty of a huntsman to gain the confidence of his hounds; the sagacity and resource of a well-trained pack are remarkable. The whipper-in, or whippers-in, when the hounds are drawing a covert, should be neither too near nor too far away from the hounds; when they have found, he should get to them as soon as possible, and take a line parallel to that of the huntsman, and prevent the pack from dividing. The quality of the hunting enjoyed at the present day is probably as good as ever it was. Great care is exercised in the breeding of hounds and of horses, and the pace is set, on the whole, faster of late years.

F. is by no means confined to England at the present time, but has been transported to various quarters of the globe. Manitoba has had a pack since 1826, and the Peshawar Vale hounds in India are as celebrated as the Belvoir or Quorn in England. The enthusiasm of the garrisons at Alexandria and Cyprus caused hunting to be instituted there, and among other places where the sport is carried on may be mentioned Florida, where meets are held in moonlight, Bechuanaland, New Zealand, and parts of the U.S.A. There are eighty-three packs of hounds hunted in the U.S.A.

See T. F. Dale, *Fox-hunting in the Shires*, 1903; H. S. Davenport, *Memories at Random of Melton and Harborough*, 1928; C. Simpson, *Leicestershire and its Hunts*, 1926; W. Fawcett, *Hunting in*

Northumbria, 1927; S. Reeve, *For-hunting Recollections*, 1928; A. H. Higginson and J. A. Chamberlain, *Hunting in the United States and Canada*, 1928; C. F. G. R. Schwerdt, *Hampshire Hunt*, 1929, T. R. Quarrell, *Worcestershire Hunt*, 1929, L. D. R. Edwards, *Huntsmen Past and Present*, 1929, S. Sesson, *Memoirs of a Fox hunting Man*, 1929, and A. H. Higginson, *Two Centuries of Fox Hunting*, 1916.

Fox River, name of two rives of Wisconsin, U.S.A. 1. The F or Pishkata R has a course of 220 m., flowing first S, then SW entering the Illinois at Ottawa. 2. The F or Nenah R. has a generally N E course for 150 m. In the wet season

Though not snappy and quarrelsome, they are always ready for a fight, and make excellent ratters. The chief points are. Head long, flat, and narrow, with very strong teeth, small ears, small keen eyes, black nose, and clean cheeks, shoulders sloping, forelegs very straight and bony, with firm, compact feet and arched toes; chest and fore ribs narrow, hocks strong; stifles well bent; tail, which is usually cut short in puppyhood, is held erect, colour, white with black or tan markings, brindle spots being objectionable. The smooth-haired variety should have a thick, dense, and smooth coat, the rough haired, coarse, wiry and rather longer. Weight, 16 to 18 lb.



SMOOTH HAIR'D FOX TERRIER



WIRE HAIR'D FOX TERRIER

the floods spread and a natural connection is estab between Lake Michigan and the Mississippi. By means of a canal, however, ships can pass all the year round.

Fox-shark, or Thresher, name given to *Alopias vulpes*, the commonest species of sharks found in the Mediterranean and the Atlantic. Its chief characteristic is a very long tail, nearly half of its own length, which is from 12 to 18 ft., with this appendage it lashes the water furiously, hence its name. The F. follows the shoals of small fish, such as herrings or pilchards, and destroys them in great quantities.

Fox-terrier, small dogs used formerly to run with hounds, and it is probable that the I. has developed from these small hunting dogs. They were used particularly to unearth foxes from holes, but since the speed of hounds has increased it has been found impossible for such comparatively small dogs to keep up with the chase. Smooth haired terriers were first exhibited about the middle of the nineteenth century, and have become very popular as house dogs. The rough-haired variety were exhibited in 1872. F.s make intelligent and affectionate companions.

Foy, Maximilien Sébastien (1775-1823), distinguished Fr. military officer and stor, b. at Ham in Somme, France. He fought in the Icmnula under Junot, Soul, and Massena. It was in the cam-paign of 1811 that he truly distinguished himself, however, receiving his fifteenth wound on the field of Waterloo, refusing, nevertheless, to quit his post till the close of the engagement. He was afterwards employed as inspector general of infantry. From his MSS. his widow, in 1827 pub *Histoire de la guerre de la Péninsule*.

Fia Angelico, see ANGELICO

Fra Bartolommeo, see BARTOLOMMEO DI PAGHIOLO DEL FAMORINO

Fracastoro, Girolamo (1483-1553). It. physician and poet, b. at Verona, studied at Padua, becoming learned in medicine and belles-lettres. In 1502 he became prof. of philosophy at Padua, and later practised as a physician in Verona. Among his intimate friends were Cardinal Bembo, Julius Scaliger, and Gianbastista Ramusio. Among his works are *Syphilis, seu Morbi Gallici libri tres* (1530, Eng. trans., 1866), a medical poem, *De ini temperatura* (1534); *Homocentricorum*

Fraction

(1535); *De sympathia et antipathia rerum* (1546); and *De contagionibus* (1546). His *Opera Omnia* were pub. at Venice in 1555, and his poems at Padua in 1728.

Fraction, mathematics, a number which indicates one or more equal parts of a whole. A *vulgar fraction* is expressed by means of two numbers, thus, $\frac{1}{2}$ or $\frac{1}{4}$. The upper, or first, number is called the *numerator* of the F.; the lower, or second number is called the *denominator* of the F. The denominator indicates the number of parts into which the whole (or unit) is divided, and the numerator indicates the number of those parts taken to form the F.; thus, $\frac{1}{3}$ of £1 means three parts, each of which is a $\frac{1}{3}$ of £1, therefore the measure of the F. is 1s. A F. is termed *proper* when the numerator is less than the denominator, *improper* when the numerator is greater than the denominator. An *improper* F. can, therefore be expressed as a mixed number, i.e. a number of wholes + a F.; thus, $\frac{1}{2} = 1\frac{1}{2}$. A F. may be indicated in many ways, according to the number of parts expressed by the denominator, thus, $\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8}$, etc., that is to say, if the numerator and denominator be both multiplied, or both divided, by the same number, the value of the F. is unaltered. The div. may result in a *complex* F.; thus, $\frac{1}{2} = \frac{1}{2}$. Addition and subtraction of Fs. are performed by bringing both denominators to a common multiple; thus, $\frac{1}{2} + \frac{1}{3} = \frac{3}{6} + \frac{2}{6} = \frac{5}{6}$. To multiply two Fs. we multiply both numerators and both denominators; for instance, to multiply $\frac{1}{2}$ by $\frac{1}{3}$, we take first $\frac{1}{2}$ of a seventh part, that is, 5 sixtieths of the unit; but $\frac{1}{3}$ is six times as much, that is, it equals $\frac{1}{5}$. A decimal F. is indicated by a succession of digits after a decimal point. These digits indicate the numerators of vulgar Fs. whose denominators are 10, 100, 1000, and so on successively. It is only when the denominator of a vulgar F. contains factors of 2 and 5 that it can be expressed as an ordinary, or terminating, decimal, as it is only in those circumstances that its denominator can be expressed as a power of 10, that is, as 1 followed by noughts. Where there are other factors in the denominator, the vulgar F. is expressed as a *recurring* decimal F. In algebra the same rules apply for the generalised symbols as in

arithmetic; $\frac{a}{b}$ and $\frac{a+b}{a-b}$ are thus

algebraical Fs. The form:
$$\frac{1}{a+1} \\ \quad \quad \quad b+1 \\ \quad \quad \quad c+\dots$$

is called a *continued* F.

Fractional Distillation, see under DISTILLATION.

Fracture, in surgery, the breaking of any part of the bony structure of the body. The general cause of F. is a stress too great for the integrity of the bone to be maintained. The stress may result from direct violence, when the bone is directly acted upon by some external force; in this case the interposed soft tissues are usually crushed and lacerated. It may also result

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Fragonard

from indirect violence, when the shock is distributed through various parts of the skeleton, the weaker bone or part of a bone being broken; for instance, a fall on the outstretched hands is likely to cause F. of the collar-bone, although that is to some extent remote from the seat of violence. A F. may be simple, when the softer tissues are unwounded, or compound, when the broken end ruptures the skin. It may be comminuted, when the bone is broken in more than two pieces; or impacted when one broken end is driven into the other. Greenstick F. occurs in children, and consists of a bent and splintered bone: this is an incomplete F., as are also depressed, sub-penosteal, and fissured Fs. Multiple is when more than one F. is present. F. is rendered more likely by any morbid condition weakening the condition of the bone, by the condition of old age, when bone becomes more brittle, and by frosty weather, when not only is the ground harder and more slippery, but the bones themselves appear to be affected. F. may be recognised by the helpless condition of the limb. After this sign further investigation must be carried on with the minimum of movement. There may be local inflammation, and in the limbs considerable distortion may take place owing to the lack of resistance to contraction of muscle. An unmistakable symptom is *crepitus*, by which is meant the grating sensation of the broken pieces passing over each other; this symptom should never be looked for except by a surgeon. The treatment is mainly expectant; the broken ends are fitted accurately together, and the part is secured by splints or other apparatus to secure immobility. When the bone has joined, gradually increasing movement is advocated in order to accustom the muscles, tendons, etc., to the resumption of their functions.

For Fs. in horses, see under HORSES, (DISEASES).

Fracture, in geology, the characteristic appearance of the broken surfaces of minerals when they are broken in directions other than cleavage planes. The various types of Fs. are (1) smooth, where there are no marked irregularities; (2) splintery, where the surface is covered with partly detached splinters; this F. is characteristic of minerals of fibrous structure; (3) hockly, where the surface is covered with sharp irregularities of varying shape; (4) conchoidal, where the surfaces are smooth and curved.

For Diavolo, see DIAVOLO.

Fragaria, or **Fragaria**, see STRAWBERRY.

Fragmental Volcanic Rocks, see under IGNeous ROCKS.

Fragonard, Jean Honore (1732-1806), Fr. painter, b. at Grasse, Provence; studied under Chardin and Boucher, and in 1752 won the Prix de Rome. He then went to Italy, and was much influenced by the work of the Venetian painter Tiepolo. He illustrated St. Non's *Voyage de Naples et de Sicile*. In 1765 he returned to France, and executed 'Callirrhoe', commissioned by Louis XV. for reproduction in tapestry. He produced sev. decorative

paintings and many landscapes, and also worked in pastel and water-colour and engraved, but his best known works are genre paintings of contemporary life, notable for their humanity, free-drawing, and charming colour. Many are in the Louvre, including 'Bacchante Asleep,' 'Nymphs at the Bath,' 'Music Lesson,' 'The Guitar Player,' 'Cupid and a Girl,' 'The Happy Mother,' and 'The Cradle.'

'Fram' (Norwegian, forward), ship especially designed for Arctic exploration by Dr. Fridtjof Nansen, and used by him in 1893. The strength of the ship, combined with the sloping sides, successfully withstood the pressure of the ice.

Framboscia, see YAWS.

Frameries, tn. in the prov. of Hainaut, Belgium, 4 m. S.W. of Mons. There are important coal-mines here, and also a chalk quarry. It has manufs. of chicory and ropes, breweries, distilleries, brickworks and limekilns. Pop. 12,000.

Framingham, tn. of Middlesex co., Massachusetts, U.S.A., on Sudbury R., 21 m. W. of Boston. It includes S. F. and Saxavon. There are manufs. of blankets and other woollens, straw and rubber goods, and hoots and shoes. It was settled in 1647 as Danforth's Plantation and incorporated as F. in 1700. A state normal school is situated here. Pop. 23,200.

Framlingham, tn. of Suffolk, England, 22 m. N.E. of Ipswich. The tn. is built round a spacious market-place, and contains a fine flint-work church (in which are tombs of sev. notable members of the Howard family), the Albert College (1864), and the castle. This last, dating from the fourteenth century, was largely destroyed in 1650. It served as a stronghold for the Bigods, the Mowbrays, and the Howards, and was the refuge of Queen Mary after Edward VI.'s death. Pop. 2100.

Frampton, Sir George James (1860-1928), Eng. sculptor. He studied under W. S. Frith, entered the Royal Academy schools in 1881, gained the gold medal and travelling studentship in 1887, and studied in Paris under Mercié and Dagnan-Bouveret. In 1894 he exhibited at the Royal Academy and was elected an associate. In 1900 he gained the *médaille d'honneur* at the Paris Exposition. He was elected a royal academician in 1908, and knighted in the same year, and during 1911-12 was president of the Royal Society of Brit. Sculptors. Among his works are 'Peter Pan' in Kensington Gardens, the Edith Cavell memorial in Westminster, 'Lamia,' the Mitchell memorial at Newcastle, the Keene memorial, statues of Queen Victoria at Calcutta, Winnipeg, etc., and the sculpture on many famous buildings, such as the Constitutional Club and the Glasgow Art Galleries, and the figures on St. Mary's spire, Oxford.

Franc, unit of money in Franco and other countries. The name dates back to the fourteenth century, when, in 1360, a gold coin was struck bearing the effigy of King John II. on horseback and the legend *Johannes Det gracia Francorum rex*. This particular

coin went out of use in the latter half of the fifteenth century, and silver Frs. bearing the figure of the king were struck in Paris from 1576 onwards. These pieces were worth about 2 fr. 60 c of Fr. money at pre-1914 value. But it was in 1793, just after the Fr. Revolution, that the Fr. assumed the value (about 10d. in Eng. money) which it bore with slight variations from that date up to 1914. On Dec. 23, 1865, an agreement was signed by sev. European countries by which they bound themselves in the Lat. Monetary Union to adopt the decimal system of the Fr. F. In Switzerland the unit is called the F., in Italy the lira and in Greece the drachma. The F. is divided into 100 centimes. Like the monies of the other European belligerents, the Fr. F. suffered a very serious fall in value during the First World War. It dropped gradually till it reached $\frac{1}{2}$ of its value as against gold. Through the energetic measures adopted by Raymond Poincaré the value of the F. was stabilised at 124-21 to the £. As a temporary measure tokens of 1 fr., 2 fr., and of 50 c. in aluminium bronze were issued from 1920 by Fr. Chambers of Commerce. The F. was fixed at 200 to the £ on the liberation in 1944, but there were three further devaluations up to 1948 when it fell to 1060 to the £.

Francavilla, com. of Messina prov., Sicily, 10 m. N.W. of Taormina, and 27 m. N. of Catania. Pop. 6000.

Francavilla-Fontana, com. of prov. Lecce, Apulia, Italy, 20 m. S.W. of Brindisi. It has manufs. of leather and textiles. Pop. (com.) 19,000.

France, Anatole (Jacques Anatole Thibault) (1841-1924), most famous Fr. author of his time, was b. in a house now demolished at 19 Quai Malakoff, Paris; son of François Noël Thibault—an old soldier, a devout Catholic, and fervid monarchist, who kept a bookshop and specialised in rare vols. and MSS.; and who, when writing bibliophile articles, used the pseudonym France Librairie—France being short for Francois in his native Amiens. Anatole's childhood's acquaintance included a grandfather who had fought at Waterloo, and a grandmother belonging to a still earlier generation. He was sent to the Jesuit College Stanislas, where he became strongly attracted to the anc. classics—especially Homer; and he learned mediæval hist. at the Ecole des Chartes. When he was fifteen he dedicated to his parents his first literary work, *Le Légende de Sainte Radegonde* (1859). He contributed verse and articles to the smaller reviews. It was in the *Revue théâtrale* that he first signed himself Anatole France—in allusion to his father's pseudonym. For Pierre Larousse's *Grand dictionnaire* he wrote articles on masterpieces of antique art. His first pub. vol. was *Étude sur Alfred de Vigny* (1868). Later appeared some vols. of his verse. In 1876 he became an assistant in the library of the Senate under Leconte de Lisle. For the publisher Lemerre he wrote a series of 'notices' and introductions for the Fr. classics. In 1879 he pub. in one vol. two little novels,

Jocaste and *Le Chat maigre*, which show the influence of Daudet and Dickens. His originality was manifested in *Le Crime de Sylvestre Bonnard* (1881), 'a model of prose, harmonious and winged.' *Le Désir de Jean Servien*, a sad tale of the Commune, came out in 1882. *Le Livre de mon ami* (1885) is a delightful assortment of childish recollections.

On March 21, 1886, he joined the staff of *Le Temps*, succeeding Claretie as writer of 'Vie à Paris.' The following year he succeeded Scherer as writer of 'Vie littéraire' in the same paper. His conduct of this dept. illustrated his famous definition of the office of a critic: 'Racouter les aventures de son âme au milieu des chefs-d'œuvre.' In 1888 appeared a vol. of stories entitled (from the first of them) *Balthasar*. In 1890 came *Thais*, a story of a courtesan of Alexandria converted by the monk Paphnutius. About 1891 A. F. had a literary dispute with Leconte de Lisle, and was obliged to leave the Senate library. In 1892 appeared *L'Etui de nacre*, containing fifteen stories that had come out separately in different pubs.—one of them the famous *Procureur de Judée*. In 1893 he left *Le Temps*; and in the same year appeared *La Rôtisserie de la reine Pidaque*, 'a story of maze, somewhat baroque, a little too crude in places,' but introducing the Abbé Jérôme Coignard, who has been called 'the most graciously eloquent of the author's mouthpieces,' and who reappears in *Les Opinions de Jérôme Coignard* (1893). Some change of style is noted in *Le Lys rouge* (1894), a story of passion and jealousy, with characters identifiable in real life, and with picturesque scenes in Florence. A return to meditativeness marked *Le Jardin d'Épicure* (1894) and *Le Puits de Sainte-Claire* (1895).

On Jan. 23, 1896, A. F. was elected to the academy in place of Ferdinand de Lesseps. Soon afterwards the Dreyfus affair became a national scandal, and engaged much of A. F.'s activity for the next few years. It is the main theme of *Histoire contemporaine*, whose hero, the immortal M. Bergeret, voices the ideas of the author throughout four vols., *L'Orme du mail* (1897), *Le Mannequin d'osier* (1897), *L'Anneau d'améthyste* (1899), and *Monsieur Bergeret à Paris* (1901). Other works, intervening, are *Pierre Nozière* (1899) and *Clio* (1900). *Craigneville* first appeared in 1902; the 1904 ed. was dedicated to Mme Arman de Caillavet, who had been the author's inspiration for more than twenty years. About this time he wrote sev. political works: *Opinions sociales* (1902), *L'Église et la république* (1904), and *Vers les temps meilleurs* (1907). *Histoire comique*, telling of the neutralisation of a guilty passion by the suicide of the wronged lover—by no means a comic story—came in 1903. *Sur la Pierre blanche* (1905) contains a picture in the manner of H. G. Wells of a future world with no tns. The very well-known *L'Île des pingouins* (1908) is a hist. of modern France in fable recalling Voltaire. *Les Contes de Jacques tournebroche* (1908) are simple and pleasing. *Les Sept*

Femmes de la Barbe-Bleue (1909) is a whitewashing of the character of Bluebeard after the fashion of modern historians. *La Vie de Jeanne d'Arc* (1908), in two large vols., expounded the thesis that Jeanne was perpetually under hallucination, of mediocre intelligence, and without military talent—noting but a tool in the hands of the clergy, partisans of Charles VII. It was not popular.

Les Dieux ont soif (1912) had appeared serially as *Evariste Camelot*. It is among A. F.'s masterpieces, reproducing the atmosphere of the end of the eighteenth century. He visited England in 1913, fraternising with his Socialist comrades there. *La Révolte des anges* (1914) is a story of the other world, and of fallen angels become anarchists here below.

In the First World War A. F.'s occupation being weighed gone, he retired to Saint-Cyr-sur-Loire, near Tours. He pub. *Sur la voie glorieuse* (1915), a collection of patriotic articles; and he protested against the idea of a peace without victory. But the peace as settled was hateful to him, and made him an anti-militarist. By his first marriage, in the eighteen-eighties, with a great-niece of the miniature painter Jules Guérin, he had a daughter, Suzanne, who married Michel Psichari, Renan's great-grandson, killed in the First World War, and who d. leaving a son, Lucien Psichari. In the autumn of 1920 A. F. married Mlle Emma Laprévote. In 1921 he received the Nobel prize for literature. His last two works, *Le Petit Pierre* (1918) and *La Vie en fleur* (1921), were in continuation of his autobiographic, half-true, half-romantic sketches of a past epoch. His eightieth birthday brought him the homage of all the literary world; six months later he d. at Le Béchellerat, Saint-Cyr-sur-Loire. See G. Truc, *Anatole France, l'artiste et le penseur*, 1924; J. L. May, *Anatole France: the Man and his Work*, 1924; N. Séguir, *The Opinions of Anatole France* (trans. by J. L. May), 1928; L. P. Shanks, *Anatole France*, 1932; E. Scilliére, *Anatole France, critique de son temps*, 1934; and E. P. Durgan, *Anatole France*, 1937.

France is a large republic of W. Europe, lying between 51° 5' and 42° 20' N. lat., and 4° 42' W., and 7° 39' E. long. It is bounded on the N. by the Eng. Channel and the strait of Dover; on the S. by the Mediterranean Sea and Spain; on the E. by Belgium, Luxembourg, Germany, Switzerland, and Italy; and on the W. by the bay of Biscay. It is well defended by natural boundaries, the Vosges Mts. and the Rhine being on the Cter. frontier, the Juras on the Swiss, the Alps on the It., and the Pyrenees on the Sp. Only on the Belgian frontier is there no natural protection. The country is very compact in shape, somewhat like an irregular hexagon. Its greatest length is 660 m. and its greatest breadth 540 m. The area before the First World War was 207,054 sq. m., but owing to the restoration of Alsace-Lorraine by the treaty of Versailles, and the addition of four small frontier dists. from Italy in 1947 (the Tenda and Briga area (225 sq. m.)) is

now 212,659 sq. m. (including Corsica, 3367 sq. m.).

F. has a length of coast line of 1500 m. It is washed by three seas: the Mediterranean, the bay of Biscay, and the Eng. Channel. The Mediterranean has sev. good harbours in the E. part, but the W. part is flat and not easy of access. The W. coast is deficient in good harbours, many of them having been constructed at great outlay. The Riviera coast is bold and lofty, but that of the bay of Biscay is flat, with a chain of dunes, or sand-hills, near the shore, behind which lagoons are formed in many places. The Brittany coast is rugged and fringed with ls. F. has, however, no ls. of importance. Corsica is, geographically, rather a part of Italy, though politically belonging to F. and the Channel ls. belong to England. The biggest ls. are Belle Ile, Ile de Ré, and Ile d'Oléron in the bay of Biscay. The surface of F. is generally level. High lands are found in the E. and S.E. only. The N. and W. parts, exclusive of the heights in Brittany, consist of low lands which form part of the great central plain of Europe. E. of the dunes, between the Pyrenees and the Gironde, is a barren stretch of sand called 'Landes,' which is covered with coarse grass. In the S. central part of the country lie the Auvergne Mts., a cluster of heights of volcanic origin rising to between 5000 and 6000 ft., and forming a watershed whence rise the Loire, the Allier, and the Dordogne. Between the Auvergne Mts. and the Mediterranean is a chain known as the Cévennes, which rise to some 6000 ft. Their S. slopes are fertile and sunny, while the N. slopes are high-lying and dreary. N. of the Cévennes and skirting the Rhône and the Saône lies a low range of hills some 2000 ft. in height, known as the Côte d'Or, while to the E. of the N. portion of the Côte d'Or rises the lower end of the Vosges Mts., some 4000 ft. in height. The slopes of the Vosges are covered with thick forests. To the S. of the Vosges are the Jura Mts., separated from the former by a narrow depression through which runs the Saône-Rhône Canal. The Jura Mts. are over 5000 ft. in height, clothed with forests, and supporting a dense pop., engaged mainly in cattle breeding and agriculture. S. of the Jura Mts., and separated from them by the valley of the Rhône, which here widens out into Lake Geneva, are the Alps, containing Mt. Blanc (15,732 ft.). The Alps are divided into sev. chains, including the Pennine Alps in Savoy, with Mt. Blanc and the Graian and Cottian Alps further S. The Savoy Alps are largely visited by tourists, Chamonix being a well-known resort, but the Graian Alps are thinly populated. The Pyrenees on the S. frontier rise to a height of 10,000 ft. (Mt. Nethou, 11,168 ft.) and possess but few passes. The prin. is the pass of Roncevaux, 40 m. from the Atlantic coast celebrated as the scene of the death of Roland in covering the return of Charlemagne's army from Spain after war with the Saracens. Other passes are those of Perche and Pertus in the E., near

the Mediterranean coast. Owing to the height of the passes railways do not traverse the Pyrenees, the routes between France and Spain lying close to the seaboard. In the E. Pyrenees is the little republic of Andorra, 175 sq. m. in area, inhabited by 6000 people.

The largest rvs. in F. are the Loire, Garonne, Dordogne, and Adour flowing into the bay of Biscay, the Seine and Somme into the Eng. Channel, and the Rhône into the Mediterranean. The Loire is the longest riv. in F., being over 600 m. in length. Its prin. trib. are the Sarthe on the r. b. and the Allier, Cher, and Vienne on the lft. With its trib. the Loire drains an area of some 47,000 sq. m., a fifth part of the whole of F. Rising to the N. of the Cévennes, it flows in a northerly direction, gradually changing to westerly until Orleans is reached, from which point it flows W. by S. until it enters the sea. The country it serves is the finest in F., consisting of rich agric. and pasture lands, and vineyards towards the mouth. It enters the sea by a broad estuary, at the head of which stands the port of Nantes. The riv. here is too shallow for large vessels, so another port, St. Nazaire, has been made at the foot of the estuary on the N. bank. Unfortunately the bed of the Loire contains many sand-banks which, combined with its immense floods, greatly detract from its value as a navigable stream. The Rhône is 500 m. in length. It rises in the glaciers of the St. Gothard group of mts., the celebrated Rhône glacier lying just N. of the Furka Pass. Before its entry into F. it flows through Lake Geneva, and the upper portion of its course is between mt. ranges. On reaching Fr. ter. it flows through the plain of Dauphiné until it receives the waters of the Saône at Lyons, when it turns at right angles and flows due S. to the Mediterranean. Besides the Saône, with its sub-trib. the Doubs, the Rhône receives on its l. b. the Isère and Durance. Its valley is sharply delimited by the Alps and the Cévennes, while the bed of the Saône and the Doubs is enclosed by the Côte d'Or Mts. and the Vosges and Jura chains. The lower part of the Rhône valley is covered with vineyards. The mts. lying so near the riv. on both sides, their torrents give it an impetuous flow that renders it of little use for navigation. Moreover, the Mediterranean being practically tideless, the soil washed down quickly deposits at the mouth and chokes it up. The Saône and Doubs are, however, tranquil streams on which a good deal of domestic traffic is carried on. The quantity of water discharged by the Rhône is so great that it exceeds that of all other Fr. rvs. put together.

The Seine is 485 m. in length. It rises N. of Dijon and flows in a north-westerly direction. On its right it receives the Marne and Oise and on its left the Yonne. Its flow is regular and calm. Upon its banks stands Paris and at its mouth Le Havre, the second port of F. The stream is easily navigable, and ships of considerable tonnage can go up as far

as Rouen, 56 m from Le Havre. The Garonne, 346 m in length, rises in Spain and flows after making a broad easterly sweep N W into the Gironde estuary at Bordeaux. It receives on its r. b. the Lot Tarn, and Dordogne, all of which rise in the Auvergne Mts. Though the torrential rains cause frequent floods on the Garonne it is nevertheless a stream of great importance for navigation. The ter. it waters and the banks of the Gironde are mainly devoted to the cultivation of the vine.

Average temp during the winter is only 36° F., and the hot spell during the summer is not of long duration. The rainfall in Paris is 150 days per annum. The climate of the Mediterranean seaboard is of a sub-tropical character, the winter being temperate and the summer intensely hot. It is moderated however by the 'mistral', a cold, boisterous wind which blows with great force from the central plateau, and which by driving off the moist air from the Mediterranean



John H. Ston

A FISHING BOAT AT THE VILLAGE PORT MARSEILLE

Climate—Owing to its proximity to the sea the climate of France is on the whole temperate. It feels the moderating effect of the Gulf Stream not however to so great an extent as England. The winters are mild and the summers not overbearingly hot. The prevailing wind is westerly and brings many rainy days especially on the coast of Brittany, where it rains some 170 days during the year. The rain is however very well distributed and the annual rainfall is therefore small being only some 20 in. Snow is not very heavy in the plains but is of course abundant on the Pyrenees and Alps as well as in the mountainous districts of the centre. The N.E. highlands have a climate resembling that of central Europe. The climate of Brittany corresponds closely to that of the S.W. coast of England, and is more moderate than the rest of France. In Paris the extremes are greater, but even here the

lessens the frequency of rainfall along the Riviera.

Agriculture and Land Tenure—The soil of France, enjoying genial sunshines and frequent showers, is on the whole very fertile and in 1947 12 420 000 workers were employed in agriculture. The total agricultural land in 1944 was 136 000 000 ac, of which 99 000 000 ac were under crops, fallow or grass, 2 00 000 forest, and 11 500 000 moorland or uncultivated. What is the chief cereal crop? The area sown with wheat in 1947 was 4 342 000 ac, producing 3 300 000 tons—a figure only half that of 1946 owing to the bad 1947 harvest. Next in importance among cereals are oats 6 247 500 ac (1947), rye, 1 225 000 (1947), barley, buckwheat and maize. Nearly 2 00 000 ac were devoted to potatoes in 1947, and just over 3 000 000 ac to roots and cabbages. Beet is also considerably cultivated for

the purpose of making sugar, and 732,500 ac. were devoted to it in 1947. About 3,800,000 ac. were under vines in 1947. Although F. is the greatest wine-producing country of the world, its yield in 1947 being about 1,000,000,000 gallons, nevertheless the imports of this commodity from N. Africa greatly exceed the exports. Cider is also made on a very large scale in the N. and W., some 2,000,000 tons of apples being produced in 1947. In 1938 1,275,000,000 gallons of wine were produced; in 1942 the amount fell to 840,000,000 gallons, and in 1947 about 890,000,000 gallons. In the S. of F. mulberry-trees are specially cultivated for silkworms, particularly in Provence, Dauphine, and Languedoc. There were, before the Second World War, about 65,000 producers, and the annual production was between two and three thousand metric tons. Under the Ger. occupation the number of producers dropped to 15,500, and total production dropped to 5000 quintals. The chief industrial crops are tobacco, 73,000 ac. (1947), which is a gov. monopoly, largely grown in the basins of the Garonne and Rhône; oilseeds, 327,000 ac. (1947); flax, 87,000 ac. (1947); and hemp, 15,000 ac. (1947). The largest forests are those of Compiègne, Ardennes, Fontainebleau, Oiseaux, and the Vosges, the trees being chiefly oak, birch, pine, elm, and beech.

Industry.—In mineral wealth F. is much poorer than England. Coal and iron are widely diffused, but are found far away from each other, which greatly increases the cost of production. In 1947 the coal-mines of F. produced 47,500,000 tons, and about 220,000 underground workers were employed in the collieries in that year, new shafts were sunk in the Nord, Lorraine, and the Cévennes, and new production methods introduced as a result of the modernisation and equipment plan. The prin. coal-fields are in the N.E., near Belgium, in the valley of the Upper Loire, around St. Etienne, and around Creuzot on the Canal du Centre. The production of iron reaches in normal times an ann. average of some 45,000,000 long tons. The prin. producing dist. is in the valley of the Moselle, near Nancy, Longwy, and Briey. Other deposits are worked near Creuzot, and also in the W. Other minerals are not very abundant. Copper, zinc, lead, tin, nickel, and gold are produced, but not nearly in sufficient quantities to satisfy the nation's demands. The production of iron ore in 1947 was 18,700,000 metric tons. Oil fuel production for the same year was 4,600,000 tons. Salt is produced from brine pans on the shores of the Mediterranean and the bay of Biscay, while rock salt is found in great quantities near Naucy in the N.E. The ann. production of rock salt is some 481,000 metric tons, while the potash deposits in Alsace near Mulhouse produce about 714,000 tons annually. The country is very rich in granite, building stone, plaster, chalk, and slates.

F. ranks as one of the leading manufacturing countries of the world, and engages in normal times some 9,000,000 people in

manufacturing industries. Many industries have been nationalised, including coal, electricity, gas, and aircraft production. The cement industry produces about 3,850,000 tons annually, and important progress is being made in the production of cement slag (1,150,000 tons in 1947), which was scarcely developed before the Second World War. The main textile industries are cotton, woollen, silk, and linen. The silk industry, which produces about 17,000 tons annually, is chiefly carried on around Lyons in the Rhône valley, also at Nîmes, Paris, St. Etienne, Tours, and other tns. Over 250,000 persons are engaged in the cultivation of silkworms, and in the manuf. of the product, and though F. no longer monopolises the world's silk trade, she is, nevertheless, the prin. nation engaged in this industry. Woollen and cotton goods are chiefly made at Tourcoing, Roubaix, Lille, and St. Quentin on the Belgian frontier, and at Rouen. Linen goods are made at Lille and Amiens, and other N. tns. The carpets and tapestry of Aubusson in the dept. of Creuse are world famous. Leather goods are manufactured at Paris, Blois, Marseilles, and boots and shoes at Paris, Limoges, Marseilles, and Toulouse. After Belgium F. is the leading country for lace, which is largely manufactured in the N.E., especially at Valenciennes. The sugar industry which produced 688,000 tons in 1947 is protected by heavy tariffs, and gives employment to some 28,000 persons. F. is also the chief glove-producing country of the world, Paris and Grenoble being the centres of the industry. The country is also noted for its dyeing and calico printing; its ceramic ware and glass, its porcelain, for which Sèvres is specially renowned; its millinery, haberdashery, fancy goods, perfumes, furniture, bronzes, and other *objets d'art* and luxury. Paris is especially the home of a great number of small industries, no less than a quarter of the total output being produced in the capital and its environs. The fishing industry is a considerable source of wealth, and employs over 130,000 persons. Apart from the Newfoundland fisheries, sardines and mackerel are caught in the bay of Biscay, and tunny off Corsica. Whaling is also carried on from Dunkirk.

Foreign Trade.—The Fr. mercantile navy in 1939 numbered 14,000 vessels of some 3,000,000 gross tons, together with sixty motor ships and about 180 sailing boats. At the end of the Second World War the tonnage had fallen to 811,000 tons, but an efficient rebuilding programme raised this to 2,500,000 tons by the end of 1948. Figures for the same year show that the tonnage of Fr. and foreign vessels entering Fr. ports amounted to 52,750,000 tons, of which 15,000,000 tons were Fr.; while the total clearings amounted to nearly 44,000,000 tons, of which about 13,000,000 were Fr. The leading ports are Marseilles, which does a quarter of the whole of Fr. shipping, Rouen, Le Havre, Dunkirk, Cherbourg, Bordeaux, Boulogne, Nantes, Calais, and St. Nazaire. The Rhône is navigable for

1200-ton vessels from the sea to Switzerland. The prin. imports are wine, coal and coke, wool, cotton, cereals, petroleum, chemicals, oleaginous fruits and seeds, machinery, raw skins, timber, rubber, copper, and coffee. The prin. exports are chemical products, iron and steel, textiles, automobiles, wine, soap, perfumes, and glass. In 1947 Fr. foreign trade comprised some 346,000,000,000 fr. worth of imports and 213,000,000,000 fr. worth of exports. The total imports comprised food and drinks, 92,154,843,000 fr.; raw materials, 169,873,697,000 fr.; and manufds. 34,464,687,000 fr. The total exports were food and drinks, 31,177,165,000 fr.; raw materials, 29,150,738,000 fr.; and manufds., 152,493,712,000 fr. Nearly one-half of the trade is with the Fr. colonies. Imports from Great Britain to F. in 1947 were 3,321,847,000 fr. and exports from F. to Great Britain were 5,178,922,000 fr.

Communications.—The compactness of Fr. ter. is very favourable to the development of good communications. Possessing as it does all kinds of stone and road-making materials, it has been able to construct a fine system of highways, due principally to the energy of Napoleon. There are now about 50,000 m. of national roads, 3500 m. of departmental roads, and 340,000 m. of local roads. The central position of the cap. also rendered it possible to plan a convenient system of railways radiating to all parts of the country. The total mileage is 26,416 m., and the main lines are the W. Railway, connecting Paris with Brest, Cherbourg, and Le Havre; the N. Railway, connecting Paris with Calais, Lille, Valenciennes, the Orleans Railway to Bordeaux and Toulouse; the E. to Strasbourg, Belfort, and Basle, the Paris-Lyon-Mediterranean Railway, and the Midi through Toulouse to the Mediterranean and the Pyrenees. All the main lines are now nationalised, and many of them electrified, including the Paris-Orléans, the P.L.M., and the Midi. Considerable damage was done to the Fr. railways by allied bombers during the Ger. occupation, and the consequent disruption of transport throughout the country greatly hampered recovery after the Second World War, but the reconstruction and re-equipment effort continues steadily.

The 150 navigable streams of F. provide over 6000 m. of internal communication, and they are connected by canals which add another 3000 m. of navigable route. The Fr. system of canals is the finest in Europe. The chief among them are the Marne and Rhine canal, which connects the Rhine with the Seine, crossing the Vosges at a height of 1110 ft.; the Canal du Centre, connecting the Saône with the Loire; the Canal du Bourgogne, connecting the Saône with the Yonne, crossing the Côte d'Or near Dijon at a height of 1200 ft.; the Canal d'Alsace, or the Rhine and Rhône canal, and the Canal du Midi, connecting the bay of Biscay with the Mediterranean by joining the Garonne at Toulouse with Céte. Inland water transport was increased during 1947 by 230,000 gross tons, and capital investment to the

amount of 2,800,000,000 fr. was devoted to material, and 800,000,000 fr. to the repair of canal and riv.-beds.

Air F. is the national air line of F., centred on Paris, the two chief air stations being Le Bourget and Orly. Le Bourget, the medium distance terminus, radiates all the European services and metropolitan services to Brussels, Amsterdam, Vienna, Prague, Cologna, Berlin, Istanbul, Warsaw and Moscow; and from Le Bourget are also operated lines to Marseilles, London, Birmingham, Manchester, Glasgow, and Belfast, all these being direct services from Paris. Also operated from Le Bourget are the metropolitan services to N. Africa. Over the long-distance lines from Orly are operated the services to New York, Buenos Aires, W. Africa (Lagos and Duala), E. Africa, Madagascar, Mauritius, and, across India, to Fr. Indo-China for Shanghai. The Fr. submarine cable system covers about 80,000 km., and all war damage on the cables is now repaired. In 1948 there were 1,350,000 telephone subscribers, of whom 363,500 were in Paris, compared with 975,000 in 1938, of whom 270,000 were in Paris.

Population.—The soil of F. was occupied in early historical times by a mixture of races, of which the Celtic Gaul preponderated. The shores along the Mediterranean were occupied by the Ligurians, the S.W. by Iberians, and the N.E. by the Belgae, Ger. immigrants who had adopted the Celtic language. Subsequently came the invasion of the Phoenicians and the Gks., the latter of whom founded Massilia, the present Marseille. Caesar subjugated the land and laid it open to Rom. influences. At the end of the fourth century began the invasion of the Teutonic tribes, and in the ninth century those of the Northmen or Normans. This mixture of races has produced the Fr. nation. The Bretons of Brittany, descended from the arct. Celts, have only in recent times become assimilated to the rest of the nation, and some 1,250,000 still use Breton as their native tongue, although about half of them also speak Fr. In the S., near the Pyrenees, some 125,000 persons speak Basque, while Fr. is spoken in Fr. Flanders, Wallonia in the N.E. of F., and Ger. in Alsace and Lorraine. Considerable differences are to be found in the inhab. of the various parts of F. The N. Frenchman is taller in stature, less vivacious than the S., the latter being darker in complexion and of more volatile disposition. The natives of different provs. exhibit different characteristics. The Gascons are loquacious and boastful, the men from the central uplands reserved and slow to make friends; the Breton melancholy and mystical; the Normans tall and self-controlled. As a nation the Fr. are gay and vivacious, renowned for politeness and sociability, artistic in their tastes, frugal and thrifty, capable of periods of great enthusiasm and liable to corresponding periods of depression. They are of great practical sense and extremely good organisers. The pop. of F. at the 1916 census was 40,518,884 (exclusive of

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military, air, and naval forces, which in 1946 numbered 310,000). The pop. per sq. m. (about 190) is very low, considering the fertility of the country. The following is a list of the depts. with their areas in sq. m. and pops. (1946):

Ain (2248) 306,700; Aisne (2866) 453,400; Allier (2848) 373,300; Alpes-Basses (2697) 83,300; Alpes-Hautes (2178) 84,900; Alpes-Maritimes (1443) 448,900; Ardèche (2144) 254,500; Ardennes (2027) 245,300; Ariège (1892) 145,900; Aube (2328) 235,200; Aude (2448) 268,800; Aveyron (3385) 307,700; Belfort (235) 86,600; Bouches-du-Rhône (2025) 976,200; Calvados (2197) 400,000; Cantal (2229) 186,800; Charente (2305) 311,100; Charente-Maritime (2791) 416,100; Cher (2819) 286,000; Corrèze (2972) 254,000; Corsica (3367) 267,800; Côte-d'Or (3391) 335,600; Côtes-du-Nord (2786) 526,900; Creuse (2163) 188,600; Dordogne (3550) 387,600; Doubs (2052) 298,200; Drôme (4532) 268,200; Euro (2330) 315,900; Eure-et-Loir (2291) 258,100; Finistère (2728) 725,700; Gard (2270) 393,200; Garonne, Haute- (2457) 512,200; Gers (2428) 190,400; Gironde (4140) 858,300; Hérault (2402) 461,000; Ille-et-Vilaine (2697) 578,200; Indre (2664) 252,000; Indre-et-Loire (2377) 311,300; Isère (3178) 574,000; Jura (1951) 216,300; Landes (3004) 218,300; Lot-et-Cher (2478) 242,100; Loire (1852) 631,500; Loire, Haute- (1930) 228,000; Loire-Inférieure (2693) 665,000; Loir-et-Cher (2629) 346,900; Lot (2017) 154,800; Lot-et-Garonne (2078) 265,400; Lozère (1998) 90,500; Maine-et-Loire (2811) 496,000; Manche (2475) 435,400; Marne (3167) 386,900; Marne, Haute- (2120) 181,800; Mayenne (1986) 250,300; Meurthe-et-Moselle (2036) 528,800; Meuse (2408) 188,700; Morbihan (2738) 506,800; Moselle (2403) 622,100; Nièvre (2658) 248,500; Nord (2228) 1,917,400; Oise (2272) 396,000; Orne (2371) 273,100; Pas-de-Calais (2606) 1,168,500; Puy-de-Dôme (3090) 478,700; Pyrénées, Basses (2977) 415,700; Pyrénées, Hautes- (1750) 201,900; Pyrénées, Orientale- (1598) 228,700; Rhin, Bas- (1848) 673,200; Rhin, Haut- (1354) 471,700; Rhône (1104) 918,800; Saône, Haute- (2014) 202,500; Saône-et-Loire (3330) 506,700; Sarthe (2410) 412,200; Savoie (2388) 235,900; Savoie, Haute- (1741) 270,100; Seine (185) 4,775,700; Seine-Inférieure (2448) 846,100; Seine-et-Marne (2275) 407,100; Seine-et-Oise (2184) 1,414,900; Sèvres, Deux (2337) 312,700; Somme (2443) 411,300; Tarn (2231) 298,100; Tarn-et-Garonne (1110) 167,500; Var (2333) 370,600; Vaucluse (1381) 249,800; Vendée (2690) 393,700; Vienne (2711) 313,900; Vienne, Haute- (2110) 336,300; Vosges (2303) 342,300; Yonne (2892) 266,000.

In 1946 four colonies were included as overseas depts.: Guadeloupe (688) 271,200; Martinique (345) 261,500; Réunion (970) 220,900; and Guiana (34,700) 28,500.

There is a tendency for the pop. to concentrate in the tns., twenty-three of which have over 100,000 inhab., viz.: Paris, 2,725,300; Marseilles, 636,200; Lyons, 460,700; Bordeaux, 253,700; Nice,

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211,100; Toulouse, 264,400; Lille, 188,800; Nantes, 200,200; Strasbourg, 175,500; St Etienne, 177,900; Le Havre, 106,900; Toulon, 125,700; Rouen, 107,700; Nancy, 113,400; Rethim, 110,700; Roubaix, 100,900; Clermont-Ferrand, 108,000; Grenoble, 102,100; Limoges, 107,800; Nîmes, 104,100; and Le Mans, 100,400.

The Fr. do not emigrate very much, but, on the contrary, many foreigners make their homes in F., there being over 1,670,700 aliens. The div. of the pop. into trades is as follows: agriculture, 9,000,000; mining, 300,000; manufs., 6,000,000; commerce, 2,000,000; transport, 1,000,000; professions, 600,000; public service, 1,000,000.

F. has been a republic since the overthrow of the empire of Napoleon III. In 1870. The constitution which was in operation until the defeat of F. in 1940 was highly central and retained many forms which had survived from the times of the kings and the emperors. It was definitely settled by the law of 1875. The country is composed of coms., each of which elects a mayor and communal council to control its affairs. Every group of ten or more coms. forms a canton, and the cantons are further grouped into arronds. Each arron. elects a council which controls local taxation. The arronds are grouped into depts., each of which contains on an average some four arronds. The depts. have replaced the old historical provs. into which F. was formerly divided, and are ninety in number, excluding three in Algeria, but including Corsica. The following is a list of the old Fr. provs., together with the depts. to which they roughly correspond: Alsace-Lorraine (Moselle, Rhin-Bas, Rhin-Haut); Aumônois (part of Charente-Maritime); Anjou (Maine-et-Loire, parts of Sarthe, Mayenne, and Indre-et-Loire); Artois (part of Pas-de-Calais); Aunis (part of Charente-Maritime); Auvergne (parts of Puy-de-Dôme, Cantal, and Haute-Loire); Avignon (part of Vaucluse); Béarn (Basses-Pyrénées); Berri (Cher and Indre); Bourbonnais (parts of Puy-de-Dôme, Creuse, and Cher); Brittany (Finistère, Côtes-du-Nord, Morbihan, and Loire-Inférieure); Burgundy (Saône-et-Loire, Côte-d'Or, and parts of Yonne and Nièvre); Champagne (Ardennes, Marne, Aube, and Haute-Marne, and parts of Aisne, Seine-et-Marne, and Yonne); Dauphiné (Drôme, Hautes-Alpes, and Isère); Flanders (Nord); Foix (part of Ariège); Franche-Comté (Doubs, Haute-Saône, and Jura); Gascons (Landes, Gers, Hautes-Pyrénées, part of Basses-Pyrénées); Guyenne (Gironde, Dordogne, Lot-et-Garonne, Lot, Tarn-et-Garonne, Languedoc, Tarn, Aude, Hérault, Gers, Ariège, parts of Hautes-Pyrénées, Haute-Garonne, Ariege, and Basses-Pyrénées); Île-de-France (Seine-et-Oise, Seine-et-Marne, Aisne, Oise, parts of Eure-et-Loir, Loiret, and Yonne); Languedoc (Tarn, Aude, Hérault, Gers, Ariège, parts of Hautes-Pyrénées, Haute-Garonne, and Tarn-et-Garonne); Limousin (Corrèze, part of Haute-Vienne); Lorraine (Meurthe-Moselle, Meuse, and Vosges); Lyonnais

(Rhône and Loire); Maine (Mayenne); Marche, la (Creuse); Nivernais (Nièvre, part of Cher); Normandy (Seine-Inférieure, Calvados, Manche, and Orne); Orléanais (Loiret, Loir-et-Cher), and parts of Eure-et-Loir, Nièvre, and Yonne); Picardy (parts of Pas-de-Calais, Somme, Nord, Oise, and Aisne); Poitou (parts of Vienne, Vendée, and Deux-Sèvres); Provence (Bouches-du-Rhône, Var, Basses-Alpes, and part of Vaucluse); Roussillon (Pyrénées-Orientales); Saintonge (part of Charente-Maritime); Touraine (part of Indre-et-Loire).

The depts. have each a general council, whose proceedings are watched by the prefect appointed by the gov. The legislative power of the country, until the Second World War, was vested in the two Houses—the Chamber of Deputies and the Senate. Parliament is still bicameral, but the two Houses are now called by other names, while the new National Assembly has greater powers in relation to the new Council of the Republic than the old Chamber of Deputies had in relation to the Senate (*see below*). The Chamber of Deputies was elected for four years by manhood suffrage, and consisted of 615 members, including ten for Algeria and ten for the other colonies. The Senate formerly contained 300 members, but with the return of Alsace-Lorraine the number was 314. By the revision of 1851, when the provisional character of the constitution was removed, the life-membership of senators was abolished. Senators were then elected for nine years by an electoral college in each dept. One-third of the Senate was re-elected every three years. Every new law must be passed by both Houses. The executive power was vested in the president of the republic. He was supported by a body of ministers whom he selected from the Chamber of Deputies.

The judicial system is under direct control of the gov. Justices of the peace exist in each canton for deciding small cases. Larger issues must be brought before the dist. tribunals. In criminal cases the preliminary investigation is carried on by an official under secrecy, and the accused is not allowed benefit of counsel until the case comes into court. The assize courts are assisted by a jury chosen by the mayor and justice of the peace in each dist. from citizens over thirty years of age. The gov. is represented by the public prosecutor. Appeal is allowed from the tribunals to the court of cassation. Convicts condemned to hard labour are transported to the penal settlements in New Caledonia and Fr. Guiana.

Defence.—Before the Second World War the Fr. active army consisted of metropolitan troops and colonial troops, and a force mobile. The latter was created in 1927, being a select body whose duty it was to resist sudden foreign attack. The metropolitan troops serve in Fr. and N. Africa, and the colonial troops in colonies outside N. Africa. The metropolitan army is recruited partly by conscription, but the three-year service, instituted in 1913, was reduced to eighteen months in

1923, and to one year in 1928. The peace strength of the metropolitan army in 1936-37 was 450,000 all ranks, including the (military) air force (40,000); the war strength was estimated at about 1,500,000. The peace strength of the colonial army was 200,000 (about 50,000 white troops, with some 10,000 in the foreign legion). During the First World War nearly 10,000,000 men passed into mobilisation. The Fr. Air Force in 1931 numbered 1350 planes, with a personnel of 62,000 (excluding the naval defence service). The number of first-line aircraft, including civil, in 1938, was approximately 3000. Precise figures for aircraft in 1939-40 are not available, but in relation to the Ger. Air Force the Fr. force was almost negligible. The strength of the Fr. Air Force, trained and equipped by the Allies, was greater in April 1945 than at the outbreak of war in 1939. The size of the Fr. Navy in relation to that of the other powers was the subject of naval conferences between the world wars. By the naval pact of 1931, which supplemented the Washington Conference (*q.v.*) and the London Naval Conference, the following tonnage of the Fr. Navy was agreed at: Capital ships, 46,666 (parity with Italy); aircraft carriers, 56,146; cruisers with guns of more than 6·1, 70,000 (parity with Italy); cruisers with guns of 6·1 or less, and destroyers, 198,233; and submarines, 81,989. Allied aid to Fr. after the national resurgence under the leadership of Gen. de Gaulle included the complete training, equipment, and maintenance of the Fr. Army by the Amer. Army in Morocco and Fr., with contributions to equipment and maintenance from Great Britain and Canada. Twenty Fr. warships (including the battleship *Richelieu*) were overhauled, refitted, and re-armed at a cost exceeding £50,000,000, and 200 vessels were added to the Fr. Navy. At the beginning of 1949 the prin. ships in service were two battleships *Richelieu* and *Jean Bart* (each 35,000 tons), launched respectively in 1939 and 1940; nine cruisers, all launched between 1923 and 1936, and ranging from 5886 to 16,000 tons; a 1943 aircraft carrier of 13,190 tons, and an escort carrier of 8200 tons. In the flotillas were included ten destroyers (2126-2620 tons), eighteen ships rated as torpedo boats, half a dozen ex-Amer. destroyer escorts; also fifteen submarines. Most of these vessels are of recent design and construction.

French Possessions.—Fr. possesses the second largest colonial empire. Under the Third Republic this was seriously developed, and Fr. regards the inhab. of the colonies as Fr. citizens and receives from them military and economic assistance. Algeria (*q.v.*) is divided into three depts., and governed as part of Fr. Morocco and Tunisia are under the minister of foreign affairs, and the other possessions are directed by the minister of colonies. By the treaty of Versailles (1919) Fr. received under mandate part of the former Ger. colonies of Togoland and Cameroons, ter. of Syria, and the Lebanon, which, however, gained their independence in 1943.

The Asiatic colonies consist of Fr. India (Pondicherry, Karikal, Chander-nagore, Mahé, and Yanaon: 196 sq. m., pop. 346,100 in 1946) and Indo-China (Viet-Nam, Tonking, Annam, Cambodia, Laos, and Cochin-China: 286,000 sq. m., 26,643,000 in 1946). Africa contains the prin. Fr. colonies, including Algeria (847,500 sq. m., 7,234,600 in 1946); Fr. Morocco (153,800 sq. m. 8,499,900 in 1940); Tunisia (48,300 sq. m., 2,608,300 in 1936); Fr. W. Africa, including Senegal, Mauritania; Fr. Sudan, Niger, Fr. Guinée, Ivory Coast, Dahomey, and Upper Volta (1,815,700 sq. m., 15,996,000 in 1945); Fr. Equatorial Africa, including Gabun, Middle Congo, Ubangi-Chari, and Chad (959,200 sq. m., 4,120,000 in 1946); Togoland (21,800 sq. m., 918,600 in 1946); Cameroons (166,400 sq. m., 2,819,900 in 1916); Fr. Somaliland (9070 sq. m., 44,800 in 1946); Madagascär (241,000 sq. m., 4,000,000 in 1946); Comoro (140 sq. m., 158,000 in 1946). In America the prin. possessions are St. Pierre and Miquelon in Newfoundland, important on account of the adjoining fisheries, Martinique and Guadalupe, and Fr. Guiana. The area and pop. of St. Pierre and Miquelon is 93 sq. m., 4300 in 1945. The area and pop. of Fr. America is 75 800 sq. m., 565,500. In Australasia Fr. possesses New Caledonia (8500 sq. m., 61,200 in 1947) and Oceania (1500 sq. m., 55,700 in 1946).

Constitution.—The preamble to the constitution of 1946, or the first constitution of the Fourth Republic, reaffirms the declaration of 1789 and the fundamental principles recognised by the laws of the republic, and proclaims, besides, a number of political, economic, and social principles as especially necessary to-day. These include equal rights for women with those of men; the right of asylum for those persecuted in their struggle for liberty; the right to work; freedom from victimisation in employment on account of beliefs, opinions, or origins; the liberty to defend one's rights and interests by syndicalist action; the right to strike within the law; collective ownership of any undertaking which has acquired the character of a national public service or *de facto* monopoly; national assurance to the individual and his family of the conditions essential to their development; guarantee to all, especially children, mothers, and the aged, of safeguards for health, material security, leisure, and rest; the solidarity and equality of all Fr. people in sacrifices resulting from national calamities; equal educational and cultural opportunity for all; and the organisation of free, public, lay education at all stages to be a state obligation. The preamble further declares that Fr. will undertake no war of conquest nor use its armed forces against the freedom of any people; subject to reciprocity Fr. assents to restrictions on her sovereignty essential to the organisation and defence of peace; and enters with her overseas peoples into a union founded on equal rights regardless of difference of race or creed—this Fr. union to comprise nations and peoples who pool their resources and efforts to develop their

respective cultures and ensure their security. The preamble concludes with the declaration that Fr. intends to promote self-government among her dependent races so that they may manage their own affairs democratically; and, avoiding any arbitrary system of colonisation, guarantees to all equality of access to public office, and to the exercise of the rights and liberties set out in this regard in the constitution. Many of the provisions of the constitution which follow the preamble are reaffirmations of the constitution of the Third Republic prior to 1940 by way of repudiating the reactionary principles of Marshal Pétain; thus is reaffirmed the principle of 'government of the people for the people and by the people.' In matters constitutional the people exercise their sovereign rights through the votes of their representatives and by referendum. The franchise is given to both sexes. Parliament consists of the National Assembly and the Council of the Republic. The assembly is elected by direct universal suffrage, the council by indirect suffrage through cons. and depts. The assembly can itself elect councillors to a number not exceeding one-sixth of the total number of members of the council. The number of members of the council may not be less than 250, nor more than 320. The council is re-eligible to the extent of one-half. Sessions may not be interrupted by adjournments for a longer total period than four months. Both Houses sit at the same time. Sessions are public. Each chamber elects its committee annually, and when the Houses are in joint session for the election of the president of the republic their committee is that of the assembly. When the assembly is not sitting its committee can convene Parliament; and it must do so on the demand of a third of the deputies or on that of the president of the council of ministers. Legislation is initiated by the president of the council of ministers and the members of Parliament. Propositions of law formulated by the Council of the Republic are transmitted without debate to the assembly, but are not valid if they involve a reduction of revenue or increased expenditure. Budgets are the province of the assembly, but the budget Bill may contain no other than strictly financial provisions. The initiation of expenditure is vested in the deputies in National Assembly. The Council of the Republic advises on Bills and propositions of law transmitted by the assembly after first reading, and if its opinion is unfavourable or not given within a specified time, the law will be promulgated in the text as voted by the assembly. If remitted with amendments the assembly will give the measure a second reading, either accepting or rejecting the council's amendments in whole or in part, and the vote on second reading is then taken publicly, and, on an absolute majority, after a further vote by the council in the same conditions, becomes law. No one may be a member of both the National Assembly and Council of the Republic. An economic council examines Bills, within its competence,

as submitted by the assembly. The president of the republic is elected by Parliament for seven years, and is only re-eligible once. He appoints the council of ministers and the councillors of state. He communicates with Parliament by messages addressed to the assembly. The functions of the president are incompatible with the exercise of any other public functions. The president, after the customary consultations, chooses the president of the council of ministers or Premier, who submits to the assembly the programme and policy of the Cabinet he proposes to constitute. The Premier and Cabinet cannot be appointed until the Premier has received the confidence of the assembly by an absolute majority. Confidence can only be refused by an absolute majority, and the passing of a vote of censure involves the resignation of the whole Cabinet. The constitution provides for dissolution of the assembly following two ministerial crises within a period of eighteen months. General elections take place at earliest in twenty days and at latest in thirty days, after the dissolution. Ministers are criminally responsible for crimes and offences committed in the exercise of their duties; they may be charged by the assembly and sent before the high court chosen by the assembly at the beginning of each new chamber. The organisation and procedure of this court are determined by a special law. There is provision for a superior council of the magistracy composed of fourteen members under the presidency of the president of the republic and vice-presidency of the minister of justice, six members chosen by the National Assembly and others, including four magistrates. Revision of the constitution is decided by resolution of an absolute majority of the assembly. After a second reading within three months the assembly frames a Bill, which is then submitted to Parliament, and voted on as an ordinary law. It is then submitted to a referendum, excepting where it has been adopted on its second reading by a two-thirds majority of the assembly, or voted by a majority of three-fifths by each of the two Houses. No constitutional revision respecting the existence of the Council of the Republic can be effectuated without the consent of the council, or by recourse to a referendum. A constitutional committee, presided over by the president of the republic, and comprising the presidents of each House, seven members chosen by the assembly, and others decides whether any law voted by the assembly in effect revises the constitution. If it does the law is sent back to the assembly for fresh deliberation. If Parliament adheres to its original vote the law cannot be promulgated before the constitution has been revised by the process described above. The republican form of government, however, cannot be the subject of any proposed constitutional revision.

The Fr. union is formed, as to one part, of the Fr. republic, comprising metropolitan F. and the depts. and ter. over-

seas and, as to the other part, of the associated ter. and states. The gov. of the republic co-ordinates their combined defensive resources and directs the policy appropriate to that defence. The central organs of the union are the presidency, the high council, and the assembly of the union. The president of the Fr. republic is president of the union. The council consists of a delegation of the Fr. Gov. and of the representatives of the associated states, and its function is to assist the gov. in the general conduct of the union. The assembly of the union consists, as to half, of members representing metropolitan F. and as to the other half of members representing overseas and associated ter. The members are elected by the territorial assemblies so far as concerns overseas depts. and ter.; and, as concerns metropolitan F., as to two-thirds, by the members of the National Assembly, and as to the remaining third by the members of the Council of the Republic. The associated states may designate delegates within the limits and conditions fixed by the legislation of each state. The president convenes the assembly of the union, and closes the sessions. He must convene it on the requisition of half the members. The assembly has cognisance of Bills and proposals submitted for its advice by the National Assembly or the gov. of the Fr. republic or the govs. of the associated states. In the overseas ter. the legislative power belongs to the Parliament as regards criminal legislation, public liberties, and political and administrative organisation; in all other matters Fr. law is applicable only by express provision, or if extended to the overseas ter. by decree on the advice of the assembly of the union. One of the chief criticisms of this constitution was that the president of the republic ought to be in the position of an arbiter, and therefore elected by secret ballot, for the president should have no personal power and power should rightly be vested nowhere else but in the assemblies. M. Edouard Herriot thought that, as regards the assembly, the constitution gave no political powers, but rather privileges, so that the House was merely a kind of academy of moral and political science, rather in the position of a doctor called in for consultation, but without authority to sign a prescription. Another fundamental objection is that there is no true separation of powers as will be found, for example, in the Brit., Amer., and other democratic constitutions. It is open to doubt whether the constitution is consistent with an independent judiciary or an administration above party; for, as to the former, the council of the magistracy comprises only four magistrates out of fourteen members; and as to the latter it might seem that the country is split into a series of departmental compartments, separated from each other by different administrations. Extreme left-wing critics objected that in 1945 the people had condemned the Senate by an overwhelming majority, whereas in the new constitution the Senate reappeared under

a new name. The objection that the constitution institutes indirectly government by assembly is, however, hardly consistent with a president of the republic elected by both Houses, who, after eighteen months of a new legislature's existence, can dissolve the assembly; which body confers on him, in accord with the president of the Council of the Republic, the exceptional right to suspend a law for unconstitutionality; nor is such criticism consistent with a constitution which gives to the Council of the Republic the initiative in legislation, and the power

on the declaration of war, which found F. as financially unprepared as she was in 1939. By 1914 the public debt had grown to 33,000,000,000 fr., and was to become 300,000,000,000 fr. by 1926. Half the public debt was floating or short-term debt, but whereas before the war the service of the debt took about 1,000,000,000 fr. (20 per cent of the Budget), after the war it amounted to 18,000,000,000 fr. out of a state expenditure of some 40,000,000,000 fr., while civil and military pensions accounted for 5,000,000,000 fr. During the war F. lived on borrowing, and a war profits tax, instituted in 1916, failed to compensate for the expenditure. The pre-war income tax scheme was not applied until 1917. Immediately after the armistice Fr. financial policy was based on the assumption that Germany could pay a sum estimated at the huge figure of 400,000,000,000 gold marks. By the Act of June 1920 the tax system was revised and the business turnover tax introduced, together with higher rates of income tax. After 1921 F. entered on a period of inflation in order to meet the cost of reconstruction, and the policy of borrowing continued until, in 1923, the net borrowings amounted to nearly 16,000,000,000 fr. During the occupation of the Ruhr the value of the franc declined, and the Morgan bank of New York put at the disposal of F. 100,000,000 dollars' worth of credits. In 1924 the Poincaré Gov. proposed an all-round increase of taxes and drastic economy cuts, but in the May elections of that year Poincaré was defeated on his financial policy. The franc was then at sixty-seven to the pound sterling; by 1926 it was at 250 to the pound. Poincaré was again called upon to form a ministry of national union, and later that year the franc was stabilised at about 160 to the pound and thirty-three to the dollar. A Bill was put through the chamber providing for 100,000,000,000 fr. of fresh taxation, and an independent sinking fund was established.

In 1938 the Fr. internal debt was 384,849,000,000 fr., and the foreign debt (as at 1934) was 3,863,650,000 dollars, owed to U.S.A., and 2755,875,000 sterling owed to Britain. The commercial debt to the U.S.A., England, Japan, Holland, Argentine, etc., was about 5,000,000,000 gold francs. In 1928 the stabilisation law was passed, fixing the franc at a fifth of its normal value, i.e. at 65·5 mg. of gold instead of 322·6 mg. Fr. financial policy, as formulated in 1937, was opposed to all forms of exchange control, and adhered to the principles of the three-power monetary agreement of 1938 between Britain, F., and the U.S.A., which was, in itself, a condemnation of such control. At the end of 1944 the internal debt was consolidated, 581,110,000,000 fr., floating, 1,028,444,000,000 fr.; total, 1,609,534,000,000 fr. On Feb. 8, 1944, a financial agreement between the Brit. Gov. and the Fr. Committee of National Liberation fixed the rate of exchange at 200 fr. to the pound. A financial agreement between Great Britain and F. was



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to nominate an important fraction of the assembly of the Fr. union and committee of constitutional control. Finally it may be objected that the Council of the Republic is deprived of all powers, and that by the very manner of its election it does not represent the comms. of F., and is merely the pale reflection of an omnipotent assembly.

Finance.—F. favours indirect rather than direct taxation, i.e. on commodities rather than on persons. Before 1914 the old direct tax system, the *Quatres vieilles Contributions*, was in operation—taxes on real estate, on doors and windows, on business, and on presumptive income. Only the first exists to-day, and only in a modified form. In 1907 Caillaux, finance minister in the Clemenceau Cabinet, proposed the suppression of the old taxes and the creation of a new income tax. Fiscal reform was still under discussion

concluded in Paris (March 27, 1945) containing 'the necessary financial foundation for the resumption and development of commercial intercourse' between the franc and sterling zones, including reciprocal credits (£100,000,000 in London for F. and 20,000,000,000 fr. in Paris for Great Britain) to finance imports.

See H. G. Moulton and C. Lewis, *The French Debt Problem*, 1925, and R. M. Haig, *The Public Finances of Post-War France*, 1929 (Columbia Univ. Press).

Education.—The beginning of the present century saw the final triumph of the State in its long struggle with the Church for the control of education in F. Previous to 1880 the Church controlled its own primary and secondary education and had the power of granting univ. degrees. The law of 1880 made primary education under state control free and compulsory and took away the special privileges of the Church. Religious teaching was abolished in the schools at the same time. In 1904 teaching by religious bodies was forbidden and religious schools were closed. The highly developed educational system of F. retains the essential features which characterised it under the Third Republic (irrespective of changes made by the Vichy Gov.). Under the Third Republic the State elementary schools constituted the univ. of F., and were graded into primary, secondary, and higher classes. There was a supreme council, with administrative and deliberative functions, and a consultative committee to advise on the functioning of the school system, but the inspectors-general were in direct communication with the minister of instruction. For local administration the whole country was divided into academic areas under academic councils, which dealt with all grades of education. The law of Aug. 9, 1879, made it obligatory for each dept. to maintain two elementary training schools, one for male and one for female teachers. The Pétain Gov., however, suppressed the *écoles normales* or colleges for training elementary teachers. Teachers study for three years at a secondary school, and afterwards at special institutes. In 1938 there were upwards of eighty normal schools, each for men and women teachers. The law of June 16, 1881, made education free in all state elementary schools, and that of Aug. 9, 1882, made it obligatory for all children from six to thirteen years of age, and this age limit was extended in 1936 to fourteen years of age. The law of Oct. 30 was the organic law of education; it replaced the *salles d'asiles* by *écoles maternelles*; and estab. the freedom of private schools under the supervision of the State authority. In 1938 there were 315 higher elementary schools for boys and 240 for girls. Higher elementary education is given in continuation schools attached to the elementary schools. Secondary education is given by the State in the collèges réunis and by the coms. in the collèges. In *écoles libres*, by private individuals. The graduate course of study extending over seven years is given, being either (a)

purely classical; (b) purely modern; (c) Lat. and sciences; or (d) Lat. and modern languages. Before the war secondary education was free, but the Vichy Gov. required payment of fees in the upper forms. Higher instruction is given by the State in the univ. and in special schools, and by private individuals in the private faculties and schools. The law of July 12, 1875, provided that higher education should be free, but the law was modified in 1880 when the State secured the exclusive right to grant degrees. A decree of Dec. 28, 1885, created a general council of the faculties. There were, before the war, seventeen univ. (founded in the years shown): Aix-Marseilles (1409); Algiers; Besançon (1485); Bordeaux (1441); Caen (1432); Clermont-Ferrand (1808); Dijon (1722); Grenoble (1339); Lille (1530); Lu Lyons (1530); Montpellier (1125); Nancy (1572); Paris (1550); Poitiers (1431); Rennes (1735); Strasbourg (1567); and Toulouse (1230). Faculties are of four kinds: law, medicine, science, and letters, and in 1945 there were about 35,000 law students, 18,000 medicine, 25,000 science, 30,000 letters, and 7000 pharmacy, and about 100 theology. There is in Paris also an institution for free higher education in political science and another for the study of international law. Other higher institutions under the Ministry of Public Instruction are the Collège de F. (founded in the early sixteenth century, and with courses in literature, archaeology, mathematics, psychology, political economy, etc.); the Muséum of Natural Hist.; the Ecole Pratique des Hautes Études for hist. and philology, physico-chem., physics, etc., and having its seat at the Sorbonne; the Ecole Normale Supérieure, which prepares secondary school teachers; the Ecole des Chartes (for paleography); the Ecole des Langues vivantes; the Ecole du Louvre (art and archaeology); the Ecole des Beaux Arts (*q.v.*), and others. There are also a number of institutions of higher or technical instruction dependent on other ministries, giving courses on the applied sciences and social economy, commerce, forestry, colonial agriculture, veterinary science, civil, mining, etc., engineering; besides military and naval schools. Technical schools of a somewhat lower grade under the Ministry of Public Instruction are numerous, comprising national schools of art at Aix, Angers, Châlons, Lille, Paris, etc., and a number of professional schools and practical schools of industry and commerce.

Music.—The earliest surviving Fr. music is that of the troubadours and trouvères (eleventh-thirteenth centuries), an aristocratic art based on popular song, rhapsodic in style with an instrumental accompaniment probably improvised. Adam de la Halle (c. 1230-c. 1287), a trouvère, wrote pastoral plays interspersed with songs. In church music the new polyphonic method known as *Ars nova* was introduced from Italy by Philippe de Vitry (1291-1361) and Guillaume de Machaut (c. 1300-77). The leading

composers of the great polyphonic period that followed were Flemish, but many of them, including Dufay, Okeghem, and Josquin des Prés, lived and worked partly in F. or Burgundy. A distinctively Fr. form of secular music popular in the fourteenth-sixteenth centuries was the *chanson*, akin to the madrigal and written either for sev. voices or for solo voice and instrumental accompaniment. About 1500 the gulf between sacred and secular music widened. The Huguenot Claude Goudimel (c. 1505-72), who composed for both Catholic and Protestant rites, was the leading church composer; Clément Janequin (c. 1475-c. 1560) treated the words of the *chanson* descriptively.

The late sixteenth century saw the origin of the ballet, a court entertainment with poetry as well as dancing. It. opera was introduced by Cardinal Mazarin about 1645. The Académie Royale de Musique, now the Paris Opéra, was founded in 1669 by the poet Perrin, who collaborated with Robert Cambert (c. 1629-77) in the first Fr. opera (1671). With the fusion of Fr. ballet and It. opera in the work of the naturalised It. Lully (1632-87), the Fr. operatic tradition began.

Chambonnières (1602-c. 1672) was the first of an important line of keyboard composers, basing his style on lute technique and traditional dance measures. His most important successor was François Couperin le Grand (1668-1733), whose suites greatly developed the range of keyboard music and instrumental technique. He was followed by Rameau (1683-1764), who foreshadowed the *galant* style in instrumental music, and later in life developed Lully's operatic style, preserving the classical subjects and the prominence of the ballet but broadening the means of expression, especially in harmony. The *concerts spirituels*, founded by A. D. Philidor in 1725, opened the way for instrumental music and led eventually to the modern symphony concert.

The Paris performance in 1752 of Pergolesi's *opera buffa*, *La Serva padrona*, led to the so-called *guerre des Buffons* between partisans of the Lully-Rameau school and of the lighter It. style, among the most vocal of the latter being the philosopher Rousseau. From this controversy arose the distinctively Fr. form of *opéra-comique*, the first bourgeois non-aristocratic movement in Fr. music, though the Opéra-Comique itself had been founded in 1718 for parodies of grand opera with spoken dialogue. The chief *opéra-comique* composers of the century were Monsigny (1720-1817) and Grétry (1742-1813), another Belgian. The reforms of Gluck, aimed at reducing the supremacy of singers over dramatists and composers, were in great part associated with the Paris Opéra (1774-79). The Paris Conservatoire was founded in 1784 and reconstituted in 1795. A new type of romantic and patriotic opera was evolved by Cherubini (1760-1842), who as director of the Conservatoire exercised great influence, and Méhul (1763-1817).

For another fifty years the stage remained the centre of Fr. musical life and continued to be dominated by foreigners. The *concerts spirituels* had lapsed during the revolution, but the Société des Concerts du Conservatoire, founded by Habeneck in 1828, preserved the thread of instrumental tradition and introduced Beethoven's symphonies. Grand opera reached a peak with Rossini's *Guillaume Tell* (1829). Auber (1782-1871) was the most successful of many composers of *opéra-comique*, but after 1830 that too declined. Quite apart stood the uncouth genius of Berlioz (1803-69), whose very original work for orchestra, stage, and church was not appreciated in his lifetime. The presence of Chopin and Liszt encouraged a cult of *salon* keyboard music.

The characteristic product of the Second Empire was the operetta school of Offenbach (1819-80). Gounod's (1818-93) rather sentimental lyric drama was an attempt to bridge the artificial gap between opera and *opéra-comique*, a result achieved by Bizet (1838-75). The foundation of the Société Nationale de Musique in 1871 helped native chamber and orchestral music. Among the most distinguished composers in these forms were Franck (1822-90), a Belgian who introduced a strong mystical and Teutonic flavour, Lalo (1823-92), Saint-Saëns (1835-1921), and Fauré (1845-1924). Opera declined under Massenet (1842-1912) and was stunted by the misunderstood doctrines of Wagner. A composer of great originality who scarcely fulfilled his promise was Chabrier (1841-94). In 1894 the pupils of Franck founded the Schola Cantorum, ostensibly to raise the tone of Fr. church music, but its influence has been far wider. A new kind of musical expression, allusive rather than explicit, based on an acute harmonic perception while having much in common with the methods of painting and poetry and hence generally known as impressionism, was introduced by Debussy (1862-1918). Ravel (1875-1937), a subtle miniaturist, and the enigmatic Satie (1866-1925) belong to the same group. A more austere method appears in Roussel (1869-1937), who continued to use the traditional forms.

Under the influence of Stravinsky and others, a deeper feeling has appeared in recent years. Of new leaders, the most prominent are Honegger (b. 1892), Milhaud (b. 1892), and Poulenc (b. 1899), all of whom are still active in many fields of music.

Religion.—The prin. religion is the Rom. Catholic, which was recognised by the State until Dec. 1905 as the national religion. Before that date the State had paid for the Rom. Catholic, the Protestant, and the Jewish religions, in proportion to their respective numbers, but afterwards it paid no salaries, nor subsidised religions in any way. Marriage made by the Church is not recognised by the State, which requires the ceremony to be performed before a public functionary. On the contrary, the Rom. Catholic Church does not recognise state marriage. There are seventeen Rom. Catholic archbishops

and sixty-eight bishops. The Protestants number about 1,000,000, the majority being Calvinists, and there are about 70,000 Jews.

Law.—The laws of France were codified at the beginning of the nineteenth century at the instigation of Napoleon Bonaparte, and are still in force with but few amendments (*see CODE NAPOLEON*). The administration of justice in France is organised under four systems, known as *juridiction civile*, *juridiction commerciale*, *juridiction administrative*, and *juridiction correctionnelle et criminelle*. Within the first system come all civil cases between individuals, and these are adjudicated upon by the *tribunaux civils*. All commercial suits within the usual category are judged by the *tribunaux de commerce*, which adjudicate also upon cases of bankruptcy, there being no separate bankruptcy courts. The third system, *juridiction administrative*, comprises all actions against the gov., these being submitted to the *tribunaux administratifs*. The fourth system, *juridiction correctionnelle et criminelle*, covers all application of the penal law—by the *tribunaux correctionnels* for the repression of misdemeanours and by the courts of assize for criminal cases. The jury system is adopted in these latter only. Civil cases in which a sum of not more than 200 fr. is in dispute are tried before a justice of the peace (*juge de paix*), one being appointed to each canton. Civil cases outside the jurisdiction of the *juge de paix* are tried in the first instance before *tribunaux civils* of first instance, which exist in every *sous-préfecture*. The *tribunal civil* may also adjudicate in commercial cases where a separate *tribunal de commerce* does not exist. Appeal against the decisions of civil and commercial tribunals is made to one of the courts of appeal of which there are twenty-five. The special jurisdiction over commercial cases is administered only in those districts where a *tribunal de commerce* has been estab. by the gov. Fr. law does not allow any act of the administration to be submitted to the ordinary courts. Special tribunals, called *conseils de préfecture*, exist in every *préfecture* to adjudicate in all cases between individuals and gov. agents. Appeals against the decisions of these tribunals are made by the *conseil d'état* in Paris. Appeal against the decisions of the correctional tribunals and the courts of assize can be made only to the court of cassation, which exists to ensure the proper application of Fr. law. It has authority over all the tribunals of Fr., civil, commercial, administrative, and criminal. (There is a special system of law for and special tribunals for the adjudication of questions in which the State or its officials are concerned (*see DROIT ADMINISTRATIF*).

For Fr. language and literature *see FRENCH LANGUAGE AND LITERATURE*; for Fr. art *see FRENCH ART*.

History.—The Phoenicians and Gks. had left their mark in Gaul by the estab. of the trading station which afterwards de-

veloped into the tn. of Marseilles, but that was all. With the invasion of Gaul by Julius Caesar, however, the hist. of Fr. begins. By Caesar Gaul is divided into three parts, corresponding roughly with the following divs.: S. of the Garonne, the Aquitainians; from Garonne to Seine, the Celts; and from Seine to Rhine, the Belgae. We know that these races were composed of uncultivated tribes, and yet tribes which had risen to as high a state of civilisation as was possible without outside influence. The Gauls rapidly assimilated the civilisation and culture of Rome; they adopted a form of its language, they accepted its laws and its administration. Rom. colonies sprang up all over the country, schools were built, learning flourished, and by the second century A.D. Gaul was regarded very much in the light of the centre of learning of the Rom. Empire. But with the decline of the Rom. Empire Gaul rapidly fell under aristocratic influence. She also began to suffer from the invasions of the outside barbaric tribes, and crushing of the poorer classes by the aristocracy and clergy led to the outbreak of many revolts which were cruelly suppressed. From 395 onwards the hosts of Goths, Vandals, and Burgundians, who had long been pent up E. of the Rhine, commenced their attacks upon the W. The Burgundians were the first to settle, and they founded a kingdom which stretched down the Rhine valley from the Vosges to the sea. The Vandals, ever pressing westwards, founded a Visigothic kingdom in Spain, a kingdom which, however, included that part of Gaul which Caesar had called Aquitaine, together with a part of the Celtic domain. In 451 at the great battle of the Catalaunian plain Attilus, the last of the Romans in Gaul, defeated the Huns of Attila. The most important of the barbaric invaders of Gaul was Clovis, the Merovingian king of the Franks. The Franks were a Teutonic tribe who had lived in Belgium (the Salian Franks) and on the banks of the Sambre and the Meuse (the Riparians). Led by their king (Clovis, 481-511), the Franks invaded Gaul and quickly overran it, advancing rapidly towards Paris, which they made their capital. The master-stroke of the Fr. king Clovis was his adoption of the Christian faith. He was recognised by Rome; he was made a consul and patrician by the emperor of the E. Yet no more bloodthirsty ruffian could well be found in the hist. of Europe than this sanguinary king, and yet contemporary documents give him place in paradise, whilst that most enlightened of monarchs, Theodosius (an Arian), is borne off, on the testimony of the same documents, to everlasting torment. The Franks maintained their old Salic law, but at the same time they adopted the civilisation of Rom. Gaul. Clovis was the founder of the Merovingian line of kings. Up to the time of the conquest of Gaul the Merovingians had been but chieftains of roving tribes; now, however, they inherited the monarchy of Fr., and with it, to a very great extent, the imperial ideals which were kept up by the

officials who represented their power throughout the land, and who were chosen from the original inhab. of the land. The king held in his own hands the reins of justice, finance, and administration. But the Merovingian line spent too much of their time in quarrelling amongst themselves, and so grew up the power of the mayors of the palace, who gradually won for themselves a position which was greater than that of the king himself. A long line of puppet Merovingians followed; then for a short time a struggle between mayor and king would take place, but the mayors of the palace won, and the line of *rois fainéants* continued just as long as the mayors of the palace cared to let them. The Merovingian line was maintained until 732, although Charles Martel (*q.v.*), from 737 to 741, ruled as a mayor of the palace without even a nominal king. The greatness of the Carolingian dynasty begins with Charles Martel, who united in himself the lines of Pepin (or Pippin) and Adnult, and can therefore be said to have represented church and state. Charles Martel was responsible for the overthrow of the Arabs at Tours (732). In 741 he *d.*, and was succeeded by his sons, Carloman, who shortly retired to a monastery, and Pepin, better known as Pippin the Short, who finally, *in 751*, took the name as well as the power of king. The bishops of Rome were at this time just rising to a full realisation of their power and demanding recognition as the heads of the Church. The rising powers of the papacy, joined to the rising power of the Carolingians, were wellnigh unconquerable, and Pepin was not slow to recognise the benefits of such an alliance. He was protector of the Church; twice he descended into Italy and forced the king of the Lombards to cede him possessions which he in turn ceded to the papacy, and thus gave the papacy its claim to temporal greatness, which persisted right up to 1870. He was crowned and anointed by the pope (Stephen II.), and regarded himself not only as a king but as a priest also. He succeeded in making Aquitaine a part of the kingdom of F. This was the position when he *d.* in 768. He left two sons to succeed him, Charles the Great (Charlemagne) and Carloman. At first it seemed that the Neustrian king (Carloman) would, by his ambition and his restless spirit, cause the break-up of the kingdom, but three years after his accession he *d.*, and although he left sons, still Charles the Great was accepted by the Church and the baronage as king both of *Austrasia* and *Neustria*. Charles continued the policy of his father; he crossed the Alps to the help of the papacy again; he restored the gift of Pepin the Short; he crushed the Lombards. Then he turned his attention to the Saxon and the Arab, and after many campaigns he finally crushed also their power. He fought the Avars of Hungary; he defeated the Danes, who were at this time just beginning to make their power felt. He was to all intents and purposes overlord of W. Europe. His power was recognised in the E., the Moor trembled at his name; the king of Mercia was made

more powerful by his recognition. He now felt that the time had come when he could claim for himself the position of the emperor of the W., and re-establish a W. empire, and on Christmas Eve of the year 800 he was crowned with the imperial crown by the pope, who also did him homage. Thus was re-established the medieval ideal of a united Church and empire: the domination of the world by pope and emperor working together for its good. The immediate results of this coronation were that the papacy became the greatest power in Italy, and the title of Charles the Great to the Frankish kingdom was considerably strengthened. Charles, although he had realised the very real danger which threatened the empire from the incursions of the Danes, nevertheless helped in the disruption of his own empire by the *divs.* he himself made. This empire was split up and divided between his sons Charles, Pepin, and Louis. The two former *d.* very shortly after their father, but Louis the Pious partitioned his empire whilst his sons were yet alive, and this led to constant quarrelling and revolt. Finally, after his death, the empire was definitely partitioned between his three sons, and the three kingdoms of F., Germany, and Italy may be said to have been founded by this partition (treaty of Verdun, 843). For the next century and a half the hist. of F. and of the Holy Rom. Empire is simply the story of constant war and rebellion. The great enemies of order and the power of the Crown during this period are the barouage and the Northmen. Rouen, Bordeaux, and Aachen all fell into the hands of the Northmen. Paris itself in 886 underwent terrible siege, and yet no peace came to the land. The king (Charles the Bald) tried to buy them off, but they came again and again, each time with fresh demands. The Northmen settled at the mouths of the rive., and from there ravaged the country. Finally, in 911, Paris was again besieged. Charles the Bald was driven from the throne, and Count Odo elected king of F., but he owed his election solely to the need of driving away the Northmen, and he was kept on the throne only by the influence of the nobles. In 911 Charles the Simple, who had succeeded Odo, made peace with the Northmen, and ceded to them Normandy (the mouth of the Seine). Rollo became a Christian, paid homage of a sort to the king, and then settled in his own ter. The Northmen soon showed that they were easily able to assimilate the culture, language, and customs of the Fr., and before long had lost their old N. coarseness and tongue, and had become a Fr.-speaking chivalrous nation while still retaining the vigour of their original race. Charles the Simple showed himself as incapable as Charles the Bald, and rapidly the Carolingians became as weak as the Merovingians had been, but they still retained some of their former power. Louis IV. tried hard to win back prestige for the Crown, and to put down the power of the nobles, but Hugh, count of Paris, overshadowed him. Although Hugh could

earily have declared himself king of F., he maintained the old Carolingian line, leaving it to his son, Hugh Capet, to found the Capetian dynasty. In May 987 Louis V. d., the last of the direct line of the Carolingians, and Hugh Capet was elected king by the Church and the baronage. It was the victory of the feudal system over the monarchy. The first few Capetian kings were merely great feudal nobles who were given the royal title and a nominal allegiance. F had by this time become a feudal monarchy. But Hugh Capet did at least one great thing for the Fr monarchy: he added to an effete power the Ile de France and Paris, and also he was the first Fr king with *national* ideals. But the power of these early kings was but nominal. The influence of Normandy, however, must not be overlooked. The Normans had taken part in all the great movements of the time, they had supported the Cluniac Reformation, they had supported the Capetian dynasty, and although they owed allegiance to the Fr king, they were in reality much more powerful than he. Henry I tried conclusions with Normandy and was defeated. Baldwin of Flanders, father in law of the Conqueror, and regent for Philip I, did not in any way hinder William, duke of Normandy, from invading England. In the meantime the Fr kings had revived the ancient Carolingian claims to the middle kingdom and to sovereignty over the Church but the great struggle of empire and papacy was within sight, and Hildebrand, with his ideals of the universal power of the papacy, was preaching them during the reign of Philip I. Philip I struggled against William of Normandy toward the end of his reign, and had great trouble with the papacy, being excommunicated. During his reign occurred the First Crusade.

Under Louis VI the Capetian monarchy began to increase rapidly, and under his famous grandson, Philip Augustus, it became definitely established. Louis V had quarreled with the papacy. Louis VI by an alliance with the Church strengthened the power of the Crown. He attacked the power of Henry I of England in Normandy, and attempted to check the power of the counts of Blois. The house of Blois, however, was strengthened by the accession of Stephen of Blois to the crown of England; this, however, was neutralized by the marriage in 1137 of Louis's son to the heiress of Aquitaine. Louis VII's reign saw a reaction of the feudal baronage against the power of the Crown, which was, however, repressed. Louis VII, in 1147, set out on the Second Crusade, which proved, however, the opposite of glorious. The power of the Crown, however, did not decrease during the royal absence, and the administration under Abbott Suger was both wise and capable. In 1152 Louis VII divorced Eleanor of Aquitaine, who six weeks afterwards married Henry of Anjou, king of England and ruler of the Angevin Empire. Henry II's power was by far the greatest danger which the monarchy in F had yet to face. By his marriage Henry II had established an empire,

which extended from the Pyrenees to the Cheviots; he ruled in F, Normandy, Maine, Anjou, Touraine, Gascony, Aquitaine, and Poitou. The two greatest dangers to the Fr monarchy had arisen during the reign: the fear of the power of the house of Blois and the rise of the Angevin Empire. The accession of Philip Augustus (1180-1223) marks the highest point to which the monarchy had risen. By skilful attacks on the house of Blois he consolidated Fr power in the N., and by alliances with the rebellious sons of Henry II he prepared the way for the break up of the power of the Angevins. In 1191 he took part in the Third Crusade. Before Richard's return he had attempted to seize the greater part of Normandy, but had failed, and Richard built up a strong alliance against him. But in 1199 the death of Richard and the accession of John made clear the way for the overthrow of Angevin power in F. The battle of Bouvines (1214) founded definitely the power of F in the N. The coms, whom he had always befriended, fought for him here. Then for a time he paused. Finally the Albigensian Crusades gave Philip a hold on the S., a hold which was strengthened by his son and grandson. Administration, justice, law, had all been firmly established during his reign, and in 1223, when Philip d., he left a strong, consolidated, and powerful in the councils of Europe.

Louis VIII (1223-26) succeeded quietly and continued the work of his father. His son Louis IX (1226-70), usually known as St Louis, was only twelve years of age when his father d. His mother, Blanche of Castile, ruled for him, and during the period of the regency, as was not unnatural, there was a feudal reaction. The power of the Crown was largely extended during this reign in the S., and Henry III's attempts to reconquer the Fr possessions of his house were a failure. Louis himself was noted for the piety of his life, a piety, however, supported by good generalship, statesmanship, and vigour. In 1250 began his period of personal rule, and during that period F flourished. He continued the work of his grandfather (Philip Augustus). Perhaps the most important side of his reign was the development of the Parlement de Paris, and the subjugation of the feudal nobles by depriving them of their rights to judicial combat and private war. During his reign also was developed the Univ. of Paris, and he himself founded the Sorbonne. His reign was one of the most glorious F has ever experienced, and he himself, judged from the point of view of Christian general or statesman, must be adjudged truly great. He was succeeded by Philip III (the Bold) (1270-85), during whose reign progress continued steadily. Events outside F influenced its hist to a very great extent. The Sicilian Vespers put an end to the power of the Fr in Italy, where Charles of Anjou, a clever and unscrupulous brother of St Louis, had established a kingdom, whilst the provs of Anjou, Toulouse, and Auvergne, together with Provence, fell into the power of the Crown. Champagne was also united to

the Crown during this reign. Philip IV. (1285-1314) was cunning, unscrupulous, and ambitious. He desired to weld F. into one compact kingdom, and to extend her power. In 1286 he had recognised Edward I.'s claim to Gascony and Aquitaine, but taking as a pretext the quarrels between the sailors of the Cinque Ports and the men of Normandy, Gascony and Aquitaine were declared forfeited.

Edward now built up an alliance against Philip, but he also allied himself with the Scots, and so commenced the traditional alliance which lasted down to 1560. In

the Fr. throne, when he roused the hatred of the Eng., and began the Hundred Years war. Philip's policy of conquest in Gascony and Aquitaine, his interferences in Flanders, and hence his hindering of the Eng. woollen trade, and the help which he gave to the Scots, were the real causes of the war. The succession question in Brittany gave Edward III. an opportunity of retaliating in F. Sluys was won in 1340, Crécy in 1346, and in the following year Calais surrendered. For three years war was stopped by the outbreak of the Black Death (1347-50), and



D. McLeish

AMIENS AND ITS CATHEDRAL

The most perfect specimen of Gothic architecture in France, begun in 1220.

1300 he annexed Flanders to F., and was two years later defeated at Courtrai (1302). This victory was important, because it showed the beginning of the overthrow of the feudal cavalry by an efficient infantry. Philip summoned the states-general, which consisted of representatives of the nobles, clergy, and citizens. They were summoned first in 1302, and again in 1308 and 1314. The death of Philip the Fair saw the beginning of a rapid decline in the power of the monarchy in F. During Louis X.'s reign there was a feudal reaction and the nobles increased their power. On his death his daughter was declared incapable of ascending the throne by reason of the Salic law. His brother therefore succeeded him, and finally, with Charles IV., who ruled only six years, the Crown passed from the main line of the Capetians to the cadet house of Valois. Philip of Valois, the sixth of that name, seemed to have firmly estab. himself on

In 1350 Philip VI. d. He was succeeded by King John (1350-64), who was defeated and captured by the Black Prince at Poitiers (1356). The regency of the Dauphin Charles during the imprisonment of King John led to an attempt on the part of the states-general to control the policy of F., and this, being opposed by the baronage, led to civil war and the peasant rising known as the Jacquerie. In 1360 peace was made with Eng/nd. By this treaty Edward gave up his claim to the Fr. throne, and received large ter. to the S. of the Loire. In 1364 John d. Before his death he had estab. his fourth son as duke of Burgundy, and thus founded the Valois house. Charles V. (1364-80), who succeeded John, was successful in establishing again the power of the Crown.

In 1375 the peace of Bruges ended the first period of the Hundred Years war. Charles, however, failed to annex Brittany, although he was successful both

against the Eng. and Spaniards. He, however, depended largely for his success upon the generalship of Bertrand du Guesclin, who had adopted defensive tactics. The regency which was necessary owing to the minority of Charles VI. (1380–1422) witnessed another feudal reaction. Charles became insane in 1392; this led to the quarrels between the powerful families of the Orleanists (Armagnacs) and the party of Burgundy. The dukes of Burgundy had by this time become powerful princes, whose ambitions tended to make them less and less Fr., until we find Charles the Bold attempting to found an independent kingdom. The Armagnacs were the feudal party, the Burgundians the party of the Parisians upon whom they relied chiefly for help. The Burgundians allied themselves with the Eng., and obtained control of the mad King Charles. Henry V., renewing the quarrel with F., won the battle of Agincourt (1415), and later, with the help of the Burgundians, overran the N. of F. and forced the Fr. to sign the treaty of Troyes. By this treaty Henry V. became regent of F., married the king's daughter, Catherine, and was to succeed to the Fr. throne on the death of the king. Henry, however, d. before Charles VI., and his young son, Henry VI., was proclaimed king on the death of Charles. Simultaneously with the proclamation of Henry VI. in Paris, Charles VII. was proclaimed at Bourges. Although the duke of Bedford ruled wisely as regent, he was able only to control the N. of F. and the conduct of Gloucester drove the Burgundians into the arms of the Fr. national party. The encouragement which Joan of Arc's victories gave to the Fr. helped to a tremendous extent in bringing about the ultimate downfall of Eng. power. In 1435 the treaty of Arras was concluded between the Burgundians and the Fr. In the following year Paris was recaptured, the power of the Crown was increased by the granting of a national revenue and the control of the forces, and a despotism was made possible. Gradually the conquests of the Eng. were won back until by 1453 Calais alone remained in the hands of the Eng. king. Louis XI. did more than any other monarch to strengthen the royal power in F. The beginning of his reign, however, was not propitious. He alienated Charles the Bold of Burgundy, his nobility, and his clergy, and by the want of wisdom of his acts welded them together in the league of Public Weal. He raised up rebellions in Liège, and whilst Burgundy was occupied in putting them down he won back Normandy, which by the treaty of Conflans he had ceded without interference. After 1467 he had to oppose the schemes of Charles the Bold. He managed to hold his own until the failure of Warwick and the Lancastrians in England brought his fortunes down to a low point. He was already at war with Burgundy. Charles aimed at occupying the ter. of Lorraine and extending his possession down to the Mediterranean. He found that his scheme evoked considerable opposition and tried to occupy

the attention of Louis by an Eng. invasion of F. Edward IV., however, was bought off by Louis at the treaty of Pequigny and returned to England. Charles the Bold was finally killed at the battle of Nancy in 1477. Louis seized Burgundy and Artois, and finally it was arranged by treaty between Maximilian and Louis that Margaret, the heiress of Burgundy, should marry the Dauphin Charles and bring as her dowry the country of Burgundy and Artois. Louis had at last triumphed. Louis d. in 1483. F. was governed immediately after his death by the regent, Anne of Beaujeu. The great achievement of the regency was the marriage of Charles VIII. to Anne of Brittany, in face of the opposition of the powers of Europe and her marriage by proxy to the Emperor Maximilian.

The hist. of modern F. begins with the reign of Louis XII. The death of Charles VIII. had again raised the vexed question of the succession in Brittany, and this was again solved by the marriage of Louis XII. to Anne. He remitted much taxation, and gave the country an opportunity of becoming prosperous and wealthy. But his reign was one long story of tortuous diplomatic intrigue; first in the league of Cambrai (1508) he fought with the papacy against the growing power of Venice, next by the Holy League (1511) he found himself deserted by his one-time allies, and although Gaston de Foix won for him some successes in Italy, he was forced to make peace. England during this period once more came to the front as a European power, and by the battle of the Spurs (1513) and Flodden (1513) helped to weaken the power of F. Louis d. in 1515. The reign of Francis I. (1515–47) is important in many respects. In the first place we have the beginning of the struggle between the house of Hapsburg and the Fr., the estab. of the Fr. military prestige, the beginning of the alliance between F. and Turkey, and the preparation by the acceptance of Calvinism for the religious wars. Francis won the battle of Marignano (1515), and forced from the papacy a concord which gave him practical control of the Church in F. He became a candidate for the empire in 1519, but was unsuccessful, and in 1525 was defeated at Pavia, captured and taken a prisoner to Spain. Here he signed the treaty of Madrid, but failed to keep the terms of that treaty, and so the war dragged on during his reign. Many attempts were made to end it, e.g. at Cambrai, but it was not until towards the end of the reign that the treaty of Crespy recognised the actual facts. Francis had also inaugurated the policy of being Catholic in his policy at home and Protestant abroad. Henry II. (1547–59) was a Rom. Catholic. The Protestants were persecuted bitterly in F., although his struggles with Charles V. made a continuance of the Protestant policy necessary abroad. Charles attacked Metz, but was unsuccessful, and finally in 1558 he resigned the Crown of Spain to his eldest son. But the war dragged on, chiefly owing to the influence of the Guises in

F. Calais was won back in 1552, and in 1559 the treaty of Cateau-Cambrésis put a period to the struggles of the Hapsburgs and the Fr. The next period of Fr. hist. is taken up almost entirely with the wars of religion. During the next thirty years the real power lay in the hands of the nobility. Chief amongst the leaders of the nobles were the family of Bourbon, which was Huguenot, and which was represented by Antony of Bourbon and his brother Condé, the family of

national motives. They could not, of course, depend upon as large a body of troops as the Catholics, and the Catholics were often also supported by the king of Spain (Philip II). Between 1562 and 1570 the civil war broke out three times. Each time the war was ended by a promise of toleration to the Huguenots, and finally in 1570, matters appeared to be particularly bright for the Huguenots, who were given good terms in the treaty of St. Germain. This treaty was due largely



W. F. Mansell

CATHERINE DE' MEDICI AND VICTIMS OF THE MASSACRE OF
ST. BARTHOLOMEW'S EVE

A painting by F. Debat-Ponsan

Chatillon represented by the statesman and warrior, Coligny, admiral of F., also Huguenot; on the other side were the Guises, who, during the reign of Francis II. (1559-60), gained great influence owing to the fact that the queen (Mary Queen of Scots) was their niece, and that they were allied to the queen-mother (Catherine de' Medici). The power of the Guise family declined when Francis II. d. Charles IX. (1560-74), a boy of ten, succeeded, and the regency was obtained by the queen-mother (Catherine de' Medici). In 1562 the Guises started the religious wars by killing a number of Huguenot soldiers, and the wars thus started dragged on from 1562 to 1598. The Huguenots may on the whole be regarded as the party with

to the growing feeling in F. that the real enemy was Spain, and Charles IX. planned a united attack of Protestants and Catholics on Spain. Charles IX., between 1570 and 1572, was entirely under the influence of Coligny, and this roused the jealousy of the queen-mother, who came over completely to the side of the catholic party, and planned the assassination of Coligny and the massacre of St. Bartholomew's Eve (1572). The fifth civil war saw the rise to power of that body known as the Politique. This was an association of men who desired only the peace of the realm, and who supported the Huguenots with that aim during this war. Henry III. (1574-89) declared at first for toleration, and later against the Huguenots.

At the end of the seventh civil war, the great Catholic League was formed. Its policy was to prevent the accession of Henry of Navarre, the next heir, and a Protestant, and this policy was accepted by Henry III. In 1587 the eighth civil war broke out; but the league paid but little attention to the claims of the sovereign, and finally Henry of Guise was assassinated by command of Henry III. Paris rose in revolt against the king, who united with Henry of Navarre and besieged it. Henry III. was, however, assassinated himself, and the league was victorious for the time being. Henry of Navarre (1589-1610) was now lawful king, but the league for the time being refused to recognise him. Henry defeated the league at Arques (1589) and at Ivry (1590). He next besieged Paris; dissensions were already breaking up the league, and in 1593 Henry, who for a long time had refused to change his creed, became a Catholic, and was recognised by the states-general as king of F. In 1598 was signed the treaty of Vervins, by which Spain kept but little, and Calais was restored to F. With the aid of Spain taken away, the Catholic League collapsed, and order was restored in F. The reign of Henry IV. saw the growing popularity of the Crown. The Edict of Nantes was issued in 1598. By this edict toleration was granted the Huguenots. Henry's great minister Sully reformed the finances and justice, and helped to destroy the power of the nobles, thus helping forward the aggrandisement of the Crown. Henry IV. was assassinated in 1610, and was succeeded by his son, Louis XIII. (1610-43). The regency was left in the hands of Marie de' Medici, the queen-mother, and the nobles began to gain power again. Finally Condé headed a rebellion which resulted in the calling of the states-general for the last time before 1789 (1614). The central figure of interest during the reign of Louis XIII. is Richelieu, who, from 1624 to 1642 dominated the policy of F. Richelieu's foreign policy was directed towards establishing F. as the greatest country in Europe; his domestic policy aimed at the aggrandisement of the Crown. The age of Louis XIV. is the logical conclusion of both the foreign and domestic policy of the cardinal. The great Thirty Years war broke out in 1618, and although F. was not directly concerned, nevertheless, in order to aim a blow at Austria and Spain, Richelieu supported Gustavus Adolphus of Sweden in his attacks against the Catholics. In 1635 he was forced to take an active part in the war itself, and although his policy seemed at first unsuccessful, it ultimately triumphed; the Sp. fleet was destroyed, and Portugal was able to proclaim her independence of Spain (1640). In his domestic policy Richelieu had been equally successful. He had crushed the right of private war, he had summoned no states-general, he had taken away many of the privileges of the Huguenots. The Parlement de Paris was subordinated to the royal will and the power of the Crown was centralised.

During the first eighteen years of the reign of Louis XIV. Mazarin was the chief minister, and followed in the footsteps of Richelieu, but he was unable to exercise the same firm control. Abroad the victory of Condé at Rocroi made F. the greatest military power in Europe, and this victory was followed in 1645 by the victory at Nordlingen. The result of these victories was that in the treaty of Westphalia, which was signed in 1648, F. was given Lorraine, the bishoprics of Metz, Toul, and Verdun, together with Pinerolo in Italy. At home, however, matters were in a state of disorder. Two civil wars broke out, to which the names First and Second Fronde are applied. The First or Parl. Fronde aimed at obtaining various concessions from the Crown. This war was ended by the treaty of Rueil. Immediately afterwards the Second or Aristocratic Fronde broke out. This was led by Condé, and was more successful immediately. It was aimed against Mazarin, and that minister had twice to leave the country. But the Crown and the minister triumphed, and in 1653 the Second Fronde was finally put down. The treaty of Westphalia, while it had ended the struggle between the empire and F., had, nevertheless, extended the war into Spain. In 1659, however, was signed the treaty of Paris, by which the Spaniards ceded some ter. on the Pyrenees.

A marriage alliance was arranged between Louis XIV. and Maria Theresia, the daughter of the Sp. king. This marriage was celebrated in 1660. In the following year Mazarin d. and Louis XIV. became his own Prime Minister. Louis realised that he could trust no power save that of the Crown, and resolved to be absolute. He adopted also Richelieu's foreign policy of territorial aggrandisement. To Colbert, who had charge of the finances of the country during the early part of Louis's reign, F. owed much. He fostered trade and commerce on a distinctly protective basis, and for the time being, at any rate, trade flourished. Colbert also realised that in order to help Fr. trade the colonies must be helped and developed; the N. and W. Indies were exploited, settlements were made in India, and the colonies in N. America were extended. To a great extent Louis XIV. owed the success of his foreign policy to the financial reforms and the increase of trade and wealth for which the wise administration of Colbert was responsible. But Louis also dreamed of becoming emperor, and placing the Bourbons on the throne of the empire. The war of Devolution broke out in 1667, just after the death of Philip IV. The extension of the power of Louis XIV. over the Netherlands, however, alarmed England and Holland, who formed an alliance with Sweden to prevent Louis from carrying out his aim. Louis, however, who had already agreed with Austria that when Charles II. d. the Sp. dominions should be divided, made peace and withdrew from the Netherlands (1668). His next war was with the Dutch (1672-78). This was purely a war of retaliation. The

Dutch struggled bravely, but in spite of the alliances which were made Louis was triumphant. The treaty of Nimeguen was signed, and the Fr. made great gains in the N. Louis now turned his attention to acquiring the Rhine as the boundary of F. By means of chambers de réunion, he estab. claims to all Alsace, Lorraine, and Luxembourg, and by the treaty of Ratisbon (1684) he was allowed to keep what he claimed for twenty years.

But his policy of unnecessary aggression had raised up for him enemies all over Europe. The réunions had made the empire and Spain unfriendly; Holland was of course still hostile; and England, whilst up to 1688 it was servile, after that date, and with the accession of William III., became the centre of opposition to the ambitions of F. In 1685 he made a terrible blunder in his domestic policy in deliberately revoking the Edict of Nantes. The immediate result was that over 250,000 subjects (Huguenots) left F. Trade began to decline, and the Protestants of Europe were deeply offended by the policy. In the meantime the Catholic policy of James II. in England had brought on the revolution of 1688. Louis again here made a fatal blunder. Had he invaded & threatened Holland, William could never have crossed to England, but he invaded Germany, and William was able to sail. The appearance of a fugitive James II. at the Fr. court was a crushing blow to Louis. F. was now surrounded by enemies. The war of the Protestant Succession immediately broke out. The war was waged in Germany, where Louis cruelly laid waste the Palatinate; in Ireland, where the last hopes of the Jacobites were crushed; on the sea, where, by the battle of La Hogue (1692), the sea power of England was finally estab.; and in the Low Countries, where the war rapidly became simply a war of sieges. By the treaty of Ryswick Louis gave up all conquests, with few exceptions, gained since 1678. But the treaty was merely a truce. The king of Spain was dying, and the ambitious Louis turned to the definite estab. of Bourbon power in Europe. William III. and Louis signed two partition treaties, both of which, however, were broken, one by the death of the Electoral Prince Joseph and the second by the acceptance of the will of Charles II. by the Fr. king. The Spaniards were furious when they learnt of the partition treaties, and the Sp. king was only carrying out national policy when he left his dominions to Philip of Anjou, grandson of Louis XIV. England accepted the will also, but Louis immediately overran the Netherlands with Fr. troops, and when James II. d., recognised his son as James III. England immediately put herself at the head of the allies, and the war of the Sp. Succession broke out. It lasted from 1702 to 1713. The Fr. military power was broken by the great victories of the allies at Blenheim (1704), Ramillies (1708), Oudenarde (1708), and Malplaquet (1709), but the successes of the allies in Spain were but transient, and the capture of Gibraltar (1704) was the most

important event. The Fr. fought bravely, and by their rally at the end of the war, and also owing to the desire of the Tory party in England for peace, they gained terms at the treaty of Utrecht which their earlier performances in the war had certainly not justified. Philip of Anjou was given Spain, the Barrier was restored to Holland, and Austria was given the Sp. Netherlands, together with the It. possessions. Louis lived until 1715.

Louis XV., his great-grandson, succeeded him. Orleans became regent, and immediately a reaction set in against the policy of the late king. Orleans played for popularity. The young king's life was not of the strongest, and Orleans hoped that in the case of his death the Crown would pass, not to Philip V. of Spain, who was the nearest heir, but to him (Orleans). He therefore kept up a strict alliance with England, upon whose support he relied. It was not until after 1729 that the birth of a Dauphin finally dispelled the hopes of succession which Philip V. had, and drew together the Fr. and Sp. Bourbons into a family alliance. The early rule of Louis XV. was complicated by the Polish Succession war and the struggles of Austria and Russia against Turkey. F. was still true to her old policy of alliance with Turkey. Cardinal Fleury had just succeeded in retaining for F. a foremost place amongst the powers of Europe when the war of the Austrian Succession broke out. Whether England or F. was to be supreme in India and America was the question which had now to be solved. At first the war began as an attempt on the part of F. still further to injure the power of the house of Hapsburg in Europe, but after 1743 it became a struggle with England for the colonies. F. and Spain declared war against Austria and England. The war was fought in Germany, America, and India. In 1745 Fontenoy was won by the Fr. Frederick of Prussia withdrew from the war in 1746, and the peace of Aachen was signed in 1748. The peace was in truth but a truce, and restored simply the *status quo*. The period between the end of the war of the Austrian Succession and the outbreak of the Seven Years war was filled with dissensions in F. itself. The minister, Machault, attempted to break down class privileges, but failed. The power of the Church and of the nobles was increased, and it was only war that saved F. from revolution. By 1756 India had practically been lost by the recall of Duplex, and war was going on in America. In 1756 was accomplished that diplomatic revolution which united the interests of the Hapsburgs and Bourbons, and opposed them to England and Prussia. Such was the state of affairs when the Seven Years war broke out. The Fr. were successful in Europe and America up to 1758, but during 1759 the series of victories at Lagos, Quiberon Bay, and the Heights of Abraham (Canada) brought the power of F. down to the lowest level it had reached. Their power in India was overthrown by the surrender of Pondicherry. In Europe she had been almost equally unsuccessful.

and the great victory at Rossbach broke the military power of F. until the revolution. By the treaty of Paris F. ceded Canada and N. America to England. Minorca passed into Brit. hands, and she had to compensate Spain with Louisiana. Between 1763 and 1774 F., under the ministry chiefly of Choiseul, was engaged in internal reform and also in an attempt to raise afresh the strength of the navy for a renewed struggle with Brit. power. At home a struggle was also going on between the Jesuits and the minister, supported by the Parlement de Paris, both of whom held Jansenist views. The Society of Jesus was abolished in F. in 1762. F. maintained her alliance with both Austria and Spain, and in 1770 Marie Antoinette, archduchess of Austria, married the Dauphin. Before the end of the reign (1774) Choiseul had been dismissed, and F. left in a weakened state, the monarchy was weakened, the nobility privileged and hated, whilst the Church was distrusted and disliked. It remained now only for Louis XVI. (1774-93) to attempt reforms. The influence of Marie Antoinette during this period was pernicious. The reforms of Turgot were frustrated by her, whilst Necker was dismissed in 1781, after having attempted to manage the finances of the country for six years. During the Amer. War of Independence F. supported the colonies. Her minister, Vergennes, directed her policy with such effect that her intervention won the Amer. recognition of their independence, and restored to F. much of the lost prestige.

After the Amer. war Fr. ministers tried various means of reform, but finally public opinion in F. became so strong that the king was obliged to call the states-general for May 1789, and to restore Necker as his minister. The literary influences which had operated to bring about the revolution were many. The writings of Montesquieu, the Encyclopédistes, Voltaire, and Rousseau had concentrated public opinion on the feudal abuses of F., and, most important of all, the *Contrat Social* of Rousseau had been widely read and as widely influenced the Fr. people. The states-general met on May 5, 1789. The third estate immediately demanded that the assembly should meet together and not in its three orders. In June they adopted the title of the National Assembly and banded themselves together by an oath to make a new constitution. The king, unnerved by the tendency of events, concentrated his troops round Paris. Mirabeau demanded the disbandment of the troops; the king refused and dismissed Necker; the National Guard was formed by the people, and the Bastille stormed and taken (July 14). The fall of the Bastille led to the recall of Necker, whilst all over the country it influenced the formation of national guards and attacks on the castles of the feudal nobility. The assembly now debated the Rights of Man, and proceeded to abolish all feudal privileges. The gov. was to be by means of a single chamber, and the royal veto was only potent for six months.

In Oct. the assembly moved to Paris, whither the king had been conducted by the mob. In June the king attempted to flee the country, but was captured at Varennes and brought back. In 1791 a new constitution was promulgated. The assembly then passed a self-denying ordinance and dissolved itself (Sept. 1791). The new assembly met in Oct. It was composed chiefly of Girondists (the Moderate party) and Jacobins (or Extremists), led by Robespierre, Danton, and Marat. The question of the action of the émigrés, as the nobles who had fled the country were called in Austria and Prussia, led, after the death of the Emperor Leopold, to the declaration of war with Austria (1792). The ill success of the Fr. arms at the beginning of the war infuriated the mob, who on Aug. 10 stormed the royal palace, slaughtered the Swiss guards, and overthrew the monarchy. A new ministry at once came into office, the war was pursued with more vigour, and Dumouriez won the battle of Valmy (Sept. 20). The National Convention declared F. a republic, and Gommepes overthrew the Austrians. European war was imminent. England had up to this time taken no active part in the affairs of F., but the policy of F. was irritating and wearying, and in Feb. 1792 F. declared war against England and Holland. F. now found herself opposed by Spain, Portugal, and Austria, together with England and Holland. The Sept. massacres of 1792, the work of the Jacobins, were condemned by the Girondists, who, however, were finally outvoted by the Jacobins, who tried and executed Louis XVI. (Jan. 1793). In July of the same year the Girondists were overthrown, and the Committee of Public Safety was instituted. F. was now in the grip of the Jacobin and a reign of terror. The Jacobin policy was successful both at home and abroad. La Vendée was crushed, the allies were overthrown, and F. was free from invasion; but the Jacobins quarrelled amongst themselves, and Robespierre himself was guillotined. After the death of Robespierre affairs in F. quietened down. In 1795 the Directory was formed. This was the first attempt to set up a reactionary gov.

The gov., opposed by the forces of the Moderate as well as the Extremist party, was faced with another revolution. When putting down the insurrections by means of Napoleon's famous 'whiff of grapeshot,' it estab. the constitution of the year III., and set up a republican form of gov., which consisted of fifty directors and two councils. The policy of the Directory was successful at home and abroad; the reaction of the Royalists, who were in the majority in the councils, was put down, and the It. campaign ended in the peace of Campo Formio (1797). England was now left alone to fight F. and Napoleon left Europe to fight in Egypt; his campaign there is given in more detail elsewhere (see NAPOLEON I.). When he returned he found that a second coalition had been formed against F., and the Fr. had been

driven out of Italy. But F. was on the verge of civil war when Napoleon, aided by Sleyés and Barras, carried out the revolution of 19 Brumaire (1799), destroyed the Directory, and set up the consulate. Napoleon estab. himself as first consul. He then undertook the It campaign, where, by the victories of Marengo and Hohenlinden, he forced Austria to accept the peace of Lunéville (1801). The armed neutrality of the N was initiated to overthrow the power of Britain; but even this failed, whilst the Dan. fleet was destroyed at the battle of Copenhagen, and the accession of Alexander I. withdrew the Russians from their

overthrow the power of Britain, but ultimately failed, because he saw that he could not do without Brit. supplies himself (see CONTINENTAL SYSTEM). Finally, when Napoleon emerged from the Russian campaign, he was plunged into the War of Liberation (1813). The battle of the nations (Oct. 16-18, 1813) saw Napoleon's forces utterly defeated by a combination of Ger., Austrians, and Russians. Still Napoleon refused to make peace, and the allies entered F. from the N., whilst Wellington routed the Fr. in the S., and proclaimed Louis XVIII. Napoleon abdicated, and was exiled to Elba, whilst the first treaty of Paris was signed (1814).



'THE CORONATION OF NAPOLEON' (1804), BY DAVID

Louvre

Fr. alliance England and F. made peace by the treaty of Amiens. During the short interval of peace Napoleon re-organised the central gov., estab. a good system of education, and healed the schism in the Church by his famous concordat with the papacy. He also reduced the Fr. law to order by means of the famous Code Napoléon. In 1804 Napoleon was declared emperor by the Senate, and crowned himself at Notre Dame. In 1803 the war broke out anew, and the life of Napoleon is the hist. of Europe. (A more detailed account of the campaigns of the time will be found under NAPOLEON I.) Trafalgar was fought in Oct. and Austerlitz in Dec. 1805; Austria was forced to make peace at Presburg (1805); Germany was split up and divided into states such as the confederacy of the Rhine; Prussia was destroyed at Jena and Auerstädt; and Russia reduced to terms by the victories at Eylau and Friedland (treaty of Tilsit, 1807). Napoleon, by means of the continental system, tried to

The settlement of Europe was still under discussion when Napoleon escaped from Elba, landed in F., and rallied the Fr. around him. The campaign known as the Hundred Days took place, and Napoleon, finally defeated at Waterloo (June 18, 1815), abdicated, surrendered to the Eng., and was exiled to St. Helena, where he d. in 1821. F. settled down for a time under the gov. of Louis XVIII. On the whole, the system of government had been improved by Napoleon. Almost immediately there was a Royalist reaction in F., but for a time liberal ideas carried all before them. In 1820 the murder of the duc de Berry, however, swung the pendulum in favour of the Royalists, who remained in power practically until the revolution of 1830. The reactionary ordinance of Charles X. led to the revolution of Ju., and the Bourbon monarchy fell in F. for ever. Louis Philippe was declared king of F., and the policy of the Fr. ministry under him was most liberal in tendency. England, F., Spain, and

Portugal united together in the Quadruple Alliance, which was brought to a close by the Near E. problem, in which Thiers, whilst nominally allied to Britain, worked against her interests in the Mediterranean.

Guzot succeeded Thiers, and remained in office until 1848. Although he acquired Algeria, he did much to foster bad feeling between England and F. The question of the marriage of the queen of Spain brought open rupture between the two countries, and F. found herself practically isolated in Europe. The party of reaction was overthrown by the revolution of 1848, when Louis Philippe abdicated, and a republic was set up. Finally a constitution which gave universal suffrage and a president elected by the people was established. Prince Louis Napoleon was elected president (1848). In 1851 Napoleon carried out his *coup d'état*. A new constitution was issued. The president was to be elected for ten years; there was to be a senate (nominated by the president), and a legislative council (elected by the people). In 1852 Napoleon III. re-established the empire and proclaimed himself emperor. In 1854 England and F. in alliance fought the Crimean war. In 1856 the treaty of Paris ended the war, and declared the Danube free and the Black Sea closed to warships, but nevertheless neutral Turkey was to carry out various reforms, but the most important result was the prestige which it gave Napoleon. But there was still much opposition to Napoleon from the Republicans, and this opposition was met by repressive measures which really weakened Napoleon's power. In 1858 he went to war in alliance with Italy against Austria, but having defeated the Austrians at Solferino he withdrew from the alliance and made peace, leaving the question of It. unity to be settled later by Cavour and Garibaldi. The Prussian-Austrian war was viewed at first with equanimity by Napoleon, but the victory of Prussia and the knowledge that Ger. unity was a probability of the near future, filled him with dismay. F. was again isolated in Europe. The succession question in Spain and the putting forward of a candidate of the house of Hohenzollern (who was, however, speedily withdrawn) led to the Franco-Prussian war. The Fr. were unprepared, and after gaining a small victory were defeated at Worth and Sedan, when Napoleon III. was taken prisoner.

The empire in F. fell, and under the gov. of national defence tried to oppose the Gers. Metz, however, where Bazaine was holding out with 170,000 men, surrendered, and Paris was besieged. In 1871 Paris capitulated, and peace was signed. A huge war indemnity was demanded, and Alsace and E. Lorraine ceded. The Commune was set up in Paris, and the prov. gov., under Thiers, had difficulty in obtaining possession of that city. For the next two years Thiers ruled F., and succeeded in establishing order and restoring the finances. Much quarrelling ensued, however, as to the constitution which F. ought to adopt, and Thiers was driven by opposition from a conservative

position to an extremist one, and was then driven from power (1873). He was succeeded by MacMahon. The period of the Third Republic was definitely inaugurated by the decree of Jan. 1875, which organised the republic under what was called the constitution of 1875. MacMahon, however, was conservative and Bonapartist in sympathy. In 1879 he was succeeded by Grévy. The Republican party after this victory split into divergent groups—the Democratic Liberals, the Radicals led by Gambetta, and the Radical-Socialists of whom Clemenceau was spokesman. In opposition the Monarchs, Bonapartists, and Clericals formed a coalition, and exploited the ambition of Gen. Boulanger (q.v.) to overthrow the republic. Grévy resigned in 1887, and was replaced by Carnot. Boulanger was charged with high treason, and fled. The Moderate Republican party hoped for the support of the Catholics, but gov. prestige was weakened by the scandal connected with the bankruptcy of the Panama Company, 1893. Meanwhile, Socialism was becoming an organised force, and Jaurès was elected to Parliament in 1893. In the next year Carnot was assassinated. A wave of anti-Jewish feeling surged over F. during the Dreyfus affair, 1897-1900, which acquired so great a political significance that the very stability of the republic was threatened, while the influence of the army became *veinlich supreme* (see DREYFUS AFFAIR). The Waldeck-Rousseau ministry settled this affair with Loubet as president in succession to Faure, the anti-Dreyfusard. The next problem confronting Waldeck-Rousseau and his successor, Combe, was that of the Church, and resulted in 1905 in the separation of church and state.

One feature of pre-1914 Fr. politics was the growth of syndicalism, especially within the Confédération Générale du Travail, formed in 1895. The Clemenceau ministry of 1906 was faced with extreme labour troubles, and fell in 1909, a new Cabinet being formed by Briand (q.v.), who continued in office until the elections of 1910. Fr. foreign policy to this date had been one of colonial expansion, which in Tunis provoked a dispute with Italy (1881-83), in the Congo, and in Egypt with England, especially the Fashoda (q.v.) incident in 1898, and in Morocco with Germany in 1905 and 1911. The conquest of Tunisia caused Italy to form the Triple Alliance with Germany and Austria (May 1882), and this was countered by the Dual Alliance between F. and Russia in 1891. Fr. politics in the early twentieth century were divided over reconciliation with Germany, advocated by Caillaux, or *rapprochement* with England. The latter policy, supported by Clemenceau, resulted in the Entente Cordiale between F. and England (1904). The Agadir incident of 1911, which F. regarded as an attempt to establish Ger. influence in a Fr. sphere, nearly led to the outbreak of hostilities. The elections of 1910 had been fought over proportional representation, and electoral reform was

accepted by the Caillaux Cabinet of 1911. In 1912 Caillaux was defeated over his policy of reconciliation with Germany, and in opposition a Poincaré ministry was formed. In 1913, however, Poincaré was elected president in succession to Fallières, who retired at the end of his period of office (Feb. 1913). The first ministry under the new president was formed by Briand. After Briand resigned the same year over the issue of proportional representation, his successor, Barthou (q.v.), introduced a scheme of restoring a third year of military service. The Barthou ministry fell as soon as the scheme became law, but the repeal of the law by Viviani, who formed a Radical ministry, was prevented by the outbreak of the First World War (see EUROPE; WAR, FIRST WORLD). The prospect of war found F. neither morally nor materially ready for war. The elections of 1914 had been fought over the issue of three years' service, and public attention was diverted by the political murder of Calmette (q.v.), March 16, 1914. With the Austro-Serbian crisis and the murder of the Archduke Ferdinand (see FRANCIS FERDINAND) at Sarajevo on June 28, 1914, war became imminent. President Poincaré visited the Tsar Nicholas II. at St. Petersburg in July, and immediately after his return Austria presented Serbia with an ultimatum which was followed by a declaration of war on July 28. Russia had been forced into partial mobilisation by Austria's attitude, and Germany demanded Russia's complete demobilisation without putting similar pressure on Austria. Russia refused, and Germany declared war on Russia on Aug. 1. The Ger. mobilisation was directed against F. and Germany declared war on Aug. 3. England had been unable to announce solidarity with F. and Russia over the Serbian question, but Grey (see GREY OF FALLODON, LORD), the Eng. foreign minister, had made strenuous efforts at mediation, at the same time promising F. naval support in defending the N. coast. The Ger. invasion of Belgium caused England to declare war on Germany on Aug. 4. The Fr. who had organised their defensive on the Lorraine frontier between Germany and F., were not prepared for the violation of the neutrality of both Belgium and Luxembourg. The Ger. concentration on the W. Front amounted to seventy-two divs., of which twenty-eight were in reserve, and ten divs. of cavalry. The Fr. forces, commanded by Gen. Joffre, numbered seventy divs., of which twenty-five were in reserve, two colonial divs., ten cavalry, and twelve territorial divs. The Fr. mobilisation numbered 3,781,000 men, and of these 157,000 were in N. Africa and 935,000 in the interior. In Paris a truce was called to party politics by a *union sacrée*, and Viviani reconstructed his Cabinet. Millerand became minister of war, Ribot of finance, while Delcassé, whose policy of alliance was justified by the war, returned to the Foreign Office.

Paris was threatened by the Ger. advance, and on Sept. 2 the gov. withdrew to Bordeaux. Gen. Gallieni (q.v.), mili-

tary governor, was left in control of Paris, and by dispatching the 'army of Paris' to the front in taxi-cabs he contributed to Joffre's success in the battle of the Marne (Sept. 5-12). The hist. of F. for the next four years is essentially that of the war. Fr. industries were concentrated in the N. and N.E., and the Ger. occupation crippled their activity. Nearly all the iron and half the coal resources were also under Ger. control, but F. developed her industries in the unoccupied regions with amazing energy. In Dec. the Fr. Gov. returned to Paris. Italy, although a member of the Triple Alliance, had already by secret accords (1900 and 1902) agreed not to attack F. in the event of a Ger. invasion. The treaty of London, April 26, 1915, brought Italy into the war on the side of the Entente. In Oct. Delcassé, the foreign minister, resigned, as he no longer supported the proposed expedition to Salonika, owing to the hostility in Greece to the policy of Venizelos (q.v.). The fall of the Viviani ministry followed upon the failure of allied diplomacy in the Balkans, and on Oct. 28 a new ministry was formed by Briand. Gen. Gallieni succeeded Millerand (q.v.) as minister of war. The Briand Cabinet was reorganised in Dec. Gen. Lyautey became minister of war, but resigned in March 1917. Under a new ministry formed by Ribot, who succeeded Briand, Painlevé was made minister of war. Painlevé continued the Balkan policy of supporting Venizelos. In Sept. he could not reconstruct the Cabinet owing to the refusal of the Socialists to co-operate, as they had been forbidden passports to the International Conference at Stockholm. Malvy (q.v.), the minister of the interior under Ribot, nevertheless encouraged the Socialists who agitated for peace by negotiation. Clemenceau's criticism caused Malvy to resign, and in Sept. the whole Cabinet was reorganised, Painlevé becoming Premier. Defeatism at this time was assuming serious proportions, being encouraged by Duval, editor of the *Bonnet Rouge* newspaper, by Humbert, owner of the *Paris Journal*, and by Bolo Pasha (q.v.), financier and adventurer. The scandal that these men, and more especially Caillaux (q.v.), former Premier of F., were actually or alleged to be in the pay of the Ger., brought about the fall of the Painlevé Gov. on Nov. 16, 1917, and Clemenceau was invited to become Premier and minister of war. Energetically he fought defeatism and became virtual dictator (see CLEMENCEAU). By the treaty of Versailles, June 28, 1919, F. recovered Alsace-Lorraine (q.v.), but failed in the desire to fix the Rhine as the Ger. frontier, although the Rhineland was to be occupied by Fr. and allied troops for fifteen years. F. was also given a mandate for Syria, and, in addition, acquired Togoland and part of the Ger. Cameroons (q.v.). With the Fr. realisation that the treaty was giving them neither the security nor the reparations on which they had counted, Clemenceau became unpopular, and in the 1919 elections he was superseded by Millerand, who formed a Conservative

bloc national. Moreover, not Clemenceau, but Deschanel was elected to the presidency when Poincaré retired in 1920. At the conference of San Remo (April 1920) and Spa (July 1920) Millerand was chiefly concerned with maintaining the supremacy of F. He gave Poland military aid against the Bolsheviks and saved Warsaw. When Deschanel fell ill, Millerand was elected president. Léguès became Premier for a short time, but at the beginning of 1921 he was succeeded by Briand (see *BRIAND*)

the exploitation of the Ruhr. On Jan. 11 Fr. and Belgian troops were moved from Düsseldorf to Essen (for the Fr. occupation of the Ruhr see under *RUHR*). In the elections of 1924 Poincaré was defeated over the financial question. The *bloc national* gave way to a *bloc des gauches*, with Herriot (*q.v.*) at its head. Poincaré's retirement rendered Millerand's position as president untenable, on June 11 he resigned, and was succeeded by Gaston Doumergue (*q.v.*), who, in 1931, was followed by Doumer (*q.v.*) Herriot,



D. McLeish

THE PALACE OF VERSAILLES, SCENE OF THE TREATY OF JUNE 28, 1919

The problem before Fr. statesmen was that of the reconstruction of F., and it was hoped to effect this by making Germany pay, as Germany had made F. pay in 1871. Out of a total of 7,500,000, Fr. casualties numbered 4,506,600 (*i.e.* 1,385,300 dead, 2,675,000 wounded, and 446,300 missing). One-tenth of the country had been laid waste. The cost of reconstruction was reckoned at about £250,000,000. At the Paris Conference of 1921 the amount to be paid was reduced to 226,000,000 gold marks. Owing to Germany's default in payment, Briand initiated the method of territorial sanctions. The Brit. Gov. supported him, and Düsseldorf, Duisburg, and Ruhrort were occupied. Loucheur, Briand's chief adviser, was attempting to compromise with Rathenau, the Ger. representative at the conference of Cannes (Jan. 1922), at which reparations were discussed (see *REPARATIONS*). Briand was recalled to Paris on Jan. 11, 1922, on the assumption that he was not protecting Fr. interests, and was succeeded by Poincaré, who had stimulated the conviction in F. that Germany should be made to fulfil her treaty obligations to the letter. At the London Conference (Aug. 1922) he demanded 'productive guarantees' as a condition for allowing Germany a moratorium. These guarantees included

the new Premier, found himself in agreement with MacDonald, Prime Minister of Britain, and the Entente Cordiale was re-established. At the London Conference, July 16, 1924, the Dawes plan (*q.v.*) was accepted. In Aug. a ministerial crisis was averted in F., and Herriot gained the consent of the minister of war and of Marshal Foch to a military evacuation of the Ruhr within twelve months. The evacuation was completed by July 31, 1925. Herriot played a foremost part in the framing of the Geneva protocol (*q.v.*) at the League of Nations Assembly in Sept. 1924, and although the protocol was not ratified, it led the way to the Locarno Pact, which was negotiated during 1925 by Briand, Fr. foreign minister, with Austen Chamberlain, and Stroessmann.

Although the Herriot ministry brought a new spirit into international affairs, it was forced to resign over the financial question. The Radical bloc resigned, and with the suspension of party feuds Poincaré formed a ministry to stabilise the franc. He set up an autonomous fund commission to deal with the floating debt, and in 1926 the budget was balanced for the first time since 1913. The value of the franc was increased by 100 per cent and fluctuations were prevented. In Oct. 1927 the Radical Socialist party

withdrew its support of the gov., but in the April elections the following year the Poincaré ministry was returned to office with an increased majority. In domestic affairs the Poincaré Cabinet withstood repeated attacks from the Radical Socialists, while in foreign affairs the Briand-Kellogg Pact was concluded in Aug. 1928 (see KELLOGG PACT), and the following year Poincaré secured ratification of the Young plan, together with the Churchill-Calliau Accord with England and the Mellon-Bérenger Accord with the U.S.A. in respect of the Fr. debts. On July 26 Poincaré resigned through ill health, and Briand continued as Premier of the Poincaré Cabinet until defeated in Oct. Briand had been forced to make concessions to England at The Hague Conference in Aug., and had agreed to the evacuation of the Rhineland before the proposed Fr. frontier fortifications were begun. Briand, however, remained as foreign minister in the new gov. formed by André Tardieu. The defeat of Briand by Doumer for the presidency was regarded in Germany as a rebuff for the policy of disarmament, but, on the other hand, Fr. electoral methods do not necessarily reflect the opinion of the country.

Briand now served as foreign minister under Pierre Laval (q.v.), who nine years later was destined to prove Fr.'s evil genius. His pro-Ger. sympathies were shown even in 1931 when he and Bruning, the Ger. chancellor, planned a joint economic committee. Laval was again Premier in the following year, but he was soon succeeded by Herriot. Meanwhile Briand had d. and Doumer, the president, had been assassinated and succeeded by Lebrun. Herriot had no longer a tenure than customarily falls to the lot of a Fr. Premier and, at this time, Fr.'s obligations to America and disarmament problems made things more than usually difficult. Paul Boncour, Daladier, the future ill-starred friend of Britain, and Sarraut followed each other in quick succession in 1933. In 1934 Europe was startled by the Stavisky scandal, which may have been symptomatic of moral decadence in Fr. That it should lead to street riots is at least comprehensible, for the scandal, which involved the flotation by Stavisky in the name of the municipal credit estab. of Bayonne, of a very large sum in bogus bonds, plainly revealed much political corruption. To restore political stability Doumergue was recalled to office, with Barthou at the Quai D'Orsay. Barthou, however, fell, with Alexander of Yugoslavia, at the hands of a Czech assassin, an event which brought back Laval as foreign minister. Always equivocal in his policies, Laval now entered into an agreement with Mussolini guaranteeing the integrity of Austria. But Fr.'s main preoccupation at this time (1935) was Ger. rearmament in defiance of the Versailles Treaty. At the Stresa Conference the Brit. delegate tried to secure the return of Germany to the League of Nations, but the Fr. representative made that course

impossible through striving to enhance his country's security by inducing the League Council to denounce Germany's violation of the treaty, a course that might have been justified had the council followed up its resolution by using the full machinery of the League covenant, even by the use of force, to stop Ger. rearmament. In the result Germany, having rejected the league's resolution and denied its jurisdiction, demanded air parity with Fr. and full equality of status with other sovereign powers. Fr. ministers naturally assumed that Germany's object was to drive a wedge between Fr. and Britain and therefore refused to consider the 'peace' plan, which Hitler put forward in 1936 after having denounced the Locarno treaties.

At this time Fr. was beginning to lose the dominating position in Europe which she had held after the First World War—a position, however, which was buttressed by a system of alliances with the E. European states. After the Nazis had seized the helm in Germany, Fr. for long abstained from open opposition to Germany's policy of rearmament and expansion, though, prior to Hitler's rise to power, she had successfully opposed an understanding between Germany and Austria whether in the guise of a trade agreement or otherwise. But, in 1936, internal dissensions wrought havoc in her counsels. The so-called 'front populaire,' formed by Communists, Socialists, and Radicals under the leadership of the wealthy Socialist, Léon Blum, exactly reflected the mutual class jealousies which stultified Fr. policy in the ensuing years. This gov. at once carried out a number of social reforms, including the nationalisation of the arms industries and the adoption of a forty-hour week; but, faced with economic difficulties, its influence soon declined, especially when its counterpart in Spain was defeated, partly through lack of any effective help from Fr. to counteract the aid given to Franco by Germany and Italy. The Popular Front in Fr. disappeared in 1938 when Daladier, supported by a radical and right-wing majority, succeeded Blum. Under Daladier the forty-hour week and other reforms were abrogated and the Fr. Fascist politicians representing the Fr. Social Group—notably Laval, Bonnet, and Flandin—all defeatists—pursued a policy of appeasement, apparently in harmony with that of Neville Chamberlain, Daladier being in Sept. 1938 a party to the Munich agreement which left Fr.'s ally Czechoslovakia to the mercy of Hitler. After this the position of Fr. in Europe deteriorated rapidly. Mussolini, emboldened by Fr. weakness, advanced impudent claims to Corsica, Tunis, Nice, Savoy, and Djibouti. But even then none in Britain believed that Fr. was really the decadent nation which Ger. propagandists described her to be. None doubted when, in Sept. 1939, she took up arms with Britain in defence of Poland against Ger. aggression that she would display her traditional valour and resourcefulness. Daladier's administration, governing by emergency

decrees, now began to manifest a more emphatic right-wing tendency, and both social and political reaction found its pretext in war conditions. The Communist party, which was conducting anti-war propaganda, was suppressed, while some sections of the governing classes, with Fascist leanings, actually cherished the illusion of a *modus vivendi* with the Nazis. These and other developments naturally operated to disrupt F.'s war effort and, though the Fr. armies offered a brave resistance in the opening stages of the offensive on the W. Front, a total collapse followed late in June 1940. (See EUROPE; HISTORY; WAR, SECOND WORLD, Western Front.)

It will be necessary to examine in greater detail the causes of the downfall of F., though in some respects these are not entirely free from doubt.

The military collapse of F. came as a thunderbolt to her Brit. ally and, indeed, to the Brit. general staff. Probably the whole neutral world was still thinking of Fr. arms in terms of the dramatic Fr. resistance on the Marne, the Chemin des Dames, and at Verdun in the previous war. But the probability is that, while the Fr. soldiers of 1940 were in no way inferior to their predecessors, the faults of the Fr. general staff were almost incredibly grave. They seem to have learned little of the character of a modern war. Despite the object lessons of Spain and Poland, they obstusely refused to consider the heavy 60-75-ton tank and aeroplane as anything but auxiliary arms; and after the Little of Belgium in the summer of 1940 they did nothing to fortify F. with anti-tank traps or to cover the land with pill-boxes or other defences in depth. In short, after the gap torn in the Fr. lines at Sedan they never made any real show of resistance. The heaviest defeats, and a general position as grave as it could be on the W. Front, were alike sedulously hidden from the Fr. people by their military censorship and even at the moment when all was wellnigh lost, the people still believed that at the eleventh hour some miracle, like the battle of the Marne, would save them.

An exhaustive explanation of the Fr. collapse would occupy much space, for the causes of this historic tragedy are numerous and have their roots in tendencies operative over many years; nor, again, would it be easy to assign to any one or more of these causes the greater weight of responsibility. But, apart from the political and social weakness of F. in the period before June 1940, the completeness of the military defeat supplies the essential factor in the tragedy. It is beyond doubt that the nation was divided against itself, that its constitution was defective and that the corruptibility of many prominent Fr. politicians sapped the country's vitality. Yet even the most united and best organised nation could hardly have withstood the tremendous military odds which confronted F. in May 1940. While Germany for at least a decade previously had concentrated on perfecting a modern military machine, combining weight and

mobility for offensive use against the defences that had defeated her in 1918 and in formulating a scientific strategy, F. worn out by the previous war, staked all on the Maginot line. There is a strong element of truth in the charge that the 'Maginot mentality' wrought the ruin of F. The idea of a purely defensive strategy reflected the pacific and war-weary mind of the Fr. people and made it impossible for the Fr. high command to appreciate the change which modern scientific advance had brought about in the art of war. This unprogressive attitude was aggravated by the innate Fr. distrust of youth and the consequential devolution of all power in the hands of old men steeped in outworn traditions. When Marshal Pétain, in the hour of his surrender to Hitler, said that F. was defeated because she had too few children he would have been nearer the truth had he said that she had too many old men in high places. The conservative tradition of the *levée en masse*, borrowed from the principles of 1789, had made it difficult, if not impossible, to create a smaller but highly mechanised modern Fr. army. For Fr. politicians were ever haunted by their fear of a military *coup d'état* or even of domination by a military caste, while, for their part, the Fr. people, wedded to the idea of *égalité* even to the detriment of state organisation, demanded that every able-bodied man be conscripted. Moreover, even had her general staff been alive to modern military progress, it is doubtful whether they would have obtained before 1939 the enormous financial credits without which adequate mechanisation of the army could not have been achieved. It has been well said that it is one inevitable weakness of a democratic state that it never finds sufficient money for self-defence until too late. It is true that money was found to build the Maginot line but this, as implied above, was money spent on a static defensive strategy and therefore in accordance with the defeatist attitude engendered by belief in the practicability of collective security under the League of Nations, an idea which obtained quite as firm, if not firmer, hold in Britain. One fatal military defect in the Maginot line was that it was not continued to the sea (see also under FORTIFICATIONS), and yet, even had it been so prolonged, the result would have been to exclude the Belgian Gov. from the Fr. sphere and to force it into the arms of the Rexists or Belgian Fascists and eventually into the power of the Nazi Gov. In this manner F. suffered an annihilating military defeat. Against the 60- and 70-ton Ger. tanks and dive-bombers the traditional bravery, élan, and resourcefulness of the Fr. soldier were powerless. The defeat was enhanced by the ludicrously severe restrictions on news imposed by the Fr. censors, a factor which ultimately hastened the moral collapse of F.; for the mass of the people of Paris had no conception of the gravity of the situation, and when the city was raided by some 300 Ger. aeroplanes and the imminent advance on it of the Ger. tanks

could no longer be concealed, every road issuing from the metropolis was choked with an unending stream of refugees in cars, carts, and on foot, hampering hopelessly all military activity and leaving in the city only settled despair.

Political and social weaknesses also contributed to the defeat of F., though they were by no means the essential cause of that defeat. This is not to say that the whole episode of the Fr. collapse merely exposes the fundamental rottenness of democracy, for all hist. refutes this totalitarian argument. The people and the politicians were not responsible for the faulty tactical ideas of the Fr. general staff, and when the crisis came it was not pressure from Parliament or the electorate that determined the action of the gov. Reynaud, who had succeeded Daladier as Premier, was not defeated in the chamber; he was dismissed by the president, and his successor, Pétain, and associates never consulted Parliament on their disgraceful armistice, the terms of which were hidden from the Fr. people until it was too late to protest. In short, it was not the people, not even the army, but the generals whose morale was destroyed, and the clear lesson to be drawn from this is that democracy's true strength lies in an unuzzied Parliament and press. The past records of the rulers of unoccupied F., the men of Vichy—after the armistice the Fr. Gov. which had fled to Bordeaux moved to Vichy—showed beyond a doubt that they were united in wanting peace at almost any price and the Fr. publicists who supported Gen. de Gaulle's organisation of 'free Frenchmen' in England were agreed that men like Laval and Baudouin had long harboured dreams of welding absolute Fascist power in F. This deliberate preference of some Fr. politicians, ex-revolutionary Socialists, for disarmament, even if it were Ger., over Liberal or Socialist democracy, even if it were Fr., played its part in the Fr. collapse, aided by the now familiar 'fifth column' (q.v.) tactics. For decades past there had been many circles of Fr. politics whose patriotism had been scorned, because it implied loyalty to the hated Third Republic. In this respect F. was much weaker than Britain, for with the Brit. people it is the right that has built the State and which largely runs it; but even in the Fr. case it would be a crude over-simplification to suggest that the right seized control and betrayed the nation; for there were many men of the right whose courage remained undimmed, while even the Bordeaux Gov. included Socialists. It has been said that successful resistance was possible even at the last moment. Officers like Gen. de Gaulle thought so; so did politicians of as opposite complexion as Reynaud, Mandel (colonial secretary under Reynaud), Herriot, Louis Marin, Léon Blum, and Jeanneney. It was still possible to proclaim a state of siege, *la patrie en danger*, to call people to arms—*la levée en masse*—even though the year was 1940 and not 1793. The people could have been mobilised and set to work preparing

anti-tank traps, sowing land-mines, and so forth. But this kind of appeal to the people would necessarily have assumed a quasi-revolutionary character and corresponded too closely to the Republican instinct of the country. Dispassionate critics are entitled to believe that such a movement would never have commended itself to Gen. Weygand, now generalissimo of the Fr. armies, and his colleagues. These men and their Fascist political supporters were much more afraid of a popular movement than of success for Ger. arms. For however extraordinary the fact may appear, these men never understood the real character of the Nazis, and appear to have supposed that army officers would always in the long run each understand each other. But in any case in their inward souls many of them preferred the Hitler regime to a popular movement, and that was precisely how a whole section of Fr. capitalists felt, although b. in F. of Fr. parents. The inference cannot easily be avoided that a large proportion of the Fr. bourgeoisie were in full decay and since many years previously undermined by the 'fifth column.'

The part played in the collapse of F. by the association of economic groups, though remoter than the causes outlined above, was none the less a very real one. Fr. mining and manufacturing interests were in association with leading politicians in the development of Franco-Ger. relations. The many politico-financial scandals in which, at different times, such prominent politicians as Pétrot, Rouvier, Tardieu, Berthelot, and Laval were involved, proves the close connection resulting from the combination of capitalist enterprise with national prestige policy, held together by an all-powerful if decadent bourgeoisie. The links between economic groups, the political press, lawyer deputies, civil servants, and Cabinet ministers make an estimate of the relative influence of different factors hard to determine in their effect on Fr. nationalism, but there can be no doubt that both nationalism and capitalism, viewed as a combination of 'patriotism, power, and profits,' were effective forces in determining the direction of Fr. foreign policy. But the association above described could not be permanent. The crisis and tragedy of modern F. in 1940 was essentially a social crisis produced by the dissolution of this association: 'The political machinery, weakened by dissension and corruption, could no longer contain the more powerful economic groups which, with the well-paid help of their professional politicians, came to pursue their own policy, even at the price of the destruction of the Fr. national state. A bewildered class of civil servants came to follow whoever presented himself as leader in a disintegrating state, provided the appearance of loyalty and obedience could be preserved, and while that part of the bourgeoisie, which, as financiers, industrialists, or parl. politicians shaped Fr. politics, became deeper and deeper involved in

international machinations detrimental to the nation, the sound and solid core of Fr. nationalism, the peasant farmer, the shopkeeper, the *pensionnaire*, became tired and resigned.' (See W. Friedmann, *The Crisis of the National State, 1942*, and Schuman, *War and Diplomacy in the French Republic*.)

Daladier's administration was followed by that of Reynaud in March 1940. In the May crisis the aged Marshal Pétain and other pro-Fascists were brought into the gov. When Paris fell in mid June Reynaud, after vainly appealing to President Roosevelt for immediate help, discussed with the Brit. Gov. the question of a separate armistice, the existence of a Franco-Brit. agreement forbidding such course. In reply Mr. Churchill offered common citizenship between the two nations, emphasising that cost what it might Britain would continue the fight. When this offer was refused the Brit. Gov. agreed to consider the release of F. from her obligation provided the Fr. fleet were prevented from falling into Ger. hands. But the danger of this last contingency was enhanced by the overthrow of Reynaud and his replacement by Pétain as Premier. Pétain surrendered unconditionally to Hitler and left the Gers. in occupation of the N. part of F. and of the entire coast to the Sp. frontier. The Gers. were thus free to use the Fr. coast and its ports as bases against Britain. Mr. Churchill, however, acted swiftly against the Fr. fleet, which was now ready to act under Ger. dictation, and many of its battleships were either brought into Brit. ports, sunk, or damaged, while a number of other warships were put out of action (see NAVAL OPERATIONS IN SECOND WORLD WAR). The immediate consequence of this operation was that the Pétain Gov. broke off relations with Britain, and moving from Bordeaux to Vichy became the puppet of the Ger. Gov., its most influential member being not the aged Marshal Pétain, but his deputy, the treacherous Pierre Laval. A rump Chamber of Deputies voted for the promulgation of a new constitution to be founded on the strange basis of 'work, family, fatherland' in place of the Republican 'liberty, equality, fraternity.' President Lebrun signed, and Pétain assumed the title of chief of state. Gen. de Gaulle, the one general in F. who had striven to mechanise the Fr. Army, and who had made good his escape to Britain, formed a Fr. National Committee in London to continue the war effort. The Brit. Gov. however, while continuing to recognise the Vichy Gov., accorded every assistance to de Gaulle, who, assuming the title leader of all free Frenchmen, began to organise a Fr. Army and Navy in Britain. Soon afterwards Fr. Equatorial Africa and the Chad region transferred its allegiance to him, but his projected expedition to Dakar was a fiasco, largely owing to the inexplicable escape of two Fr. warships through the straits of Gibraltar to Dakar.

Thus perished the Third Fr. Republic. The constitutional laws of 1875, which

were the basis of the republic, were formally abrogated in Aug. 1940. Only in the unoccupied zone and the African colonies governed from Vichy did the ghost of the old republic still linger on. Gradually Hitler disembodied the nation from the state: Alsace and Lorraine were administered from Berlin as part of the Reich, the 'prohibited zone,' nearest Britain, was governed by the military authorities from Brussels, occupied F. was misgoverned from Paris. Captive F. in the shape of 1,500,000 prisoners of war, was kept in slavery in Germany. 'Free France,' which by the end of 1941 had a territorial basis in Syria, and Fr. Equatorial Africa, as well as in London, eschewed the mantle of the discredited Third Republic. Marshal Pétain alone remained direct heir of Thiers. In his regime the ghost of the republic survived in two forms: the chief of state exercised his legislative functions in the council of ministers pending the formation of new assemblies, and both senate and deputies were to remain in being until the new assemblies were formed. But even after their formation the chief of state was empowered 'in the event of tension from abroad or grave internal crisis' to wield legislative power by himself, and he alone could declare a state of siege. In Feb. 1941 a *conseil national* was set up to assist the chief of state in a purely consultative capacity, and its sessions were secret; but the avowed scheme was to create a corporative state somewhat on the It. model. The larger industrialists were given in practice if not in theory wide powers of control over economic life. The exigencies of collaboration with Germany and the dislocation of economic life made necessary a high degree of state control of industry. This tended to operate through trusts, so that the external of a corporative state were convenient to conceal the tyranny of the trusts, and to provide some measure of eventual political control. Many senators and deputies were appointed to the *conseil national*, and showed themselves, at least as individuals, far from supine in resisting the totalitarian tendencies of the Vichy Gov. In Aug. 1941 Pétain banned all political parties, all public or private political meetings. He hinted that the existing *Legion française des anciens combattants* should become the nucleus of the single-party state, which, however, seemed to imply that his own earlier efforts to form the *rassemblement pour la révolution nationale* for the same purpose had failed. In fine, if the totalitarian tendencies of the men of Vichy were evident enough, their ability to carry them out was much less certain even at this time, because it was conditioned by Fr. public opinion, and this seemed to change according to the vicissitudes of the war. Thus the victory of Britain in the battle of Britain and the continued resistance of Russia (as at Dec. 1941), when defeat had seemed almost certain, provided both stimulus and focal point for Fr. opinion. Based on the assumption of total defeat and the death of Fr. national consciousness, the

Vichy Gov. at the end of 1941 found that defeat was not certain, and that the national consciousness was reawakening, and having equipped F. with all the machinery of a Fascist regime it now failed to find the totalitarian party to drive the machine.

The re-emergence of the traditional spirit of F. was dramatically reflected by the scuttling of the Fr. fleet at Toulon (Nov. 27, 1943) soon after the allied landing in Fr. N. Africa. This act was the climax of increasing Ger. pressure and spoliation. Laval had returned to office in April 1943 as 'head of the Government with special powers,' superseding Darlan (*q.v.*), who was appointed commander of all the forces. For the time being Laval was Hitler's agent. He proclaimed his desire for a Ger. victory, and was prepared to go to any lengths to ensure it. Assuming dictatorial powers, albeit under Ger. patronage, he undertook to hand over skilled Fr. labour to Ger. war factories against the release of a small number of Fr. prisoners-of-war, invoking Germany's own heavy losses on the Russian front as a reason why Fr. labour should 'volunteer' to supply Ger. deficiencies in man-power. The Gers. demanded 130,000 skilled workmen, a number which would have enabled them to set at least 1,000,000 unskilled or semi-skilled men and women to work; but the 150,000 were not handed over—a temporary victory for Fr. labour. Laval was more successful in destroying the last vestiges of the parl. system, by abolishing the offices of president of the Senate and the Chamber. But throughout these violations of Fr. liberties sabotage and the killing of Ger. soldiers continued, notwithstanding the dire penalties which followed, and scores of hostages faced the Ger. firing squads. It was in the same defiant spirit that the Fr. fleet sacrificed itself at Toulon. When the Anglo-Amer. forces landed in Fr. N. Africa, the Gers. at once overran Vichy F. Hitler, to gain time, designated Toulon a special area which Ger. troops were not to enter. His real intentions were shown on Nov. 27, when the Gers. began to march in. The many warships were then either scuttled or damaged—an act of immolation which restored Fr. honour and reasserted Fr. sovereignty. Under an arrangement with Gen. Eisenhower (*q.v.*) Darlan assumed responsibility for the civil administration in N. Africa as a temporary measure. Till then he had been both advocate and architect of collaboration with Germany, and his pretensions naturally aroused the strongest resentment among the allied powers, not least among the adherents of Gen. de Gaulle, whose F're Fr. movement, for political reasons, had recently been renamed Fighting Fr. On Christmas Eve, however, Darlan was assassinated in Algiers and Gen. Giraud (*q.v.*), who had opposed compromise with the Gers., was appointed his successor. The brave stand which Gen. de Gaulle and his colleagues had sustained since the days of capitulation in June 1940 assumed a wider and more corporate form after the

landings in N. Africa; and Gen. Giraud, who enjoyed esteem among his compatriots for his legendary escape from a Ger. fortress and among the Allies for his military reputation, was confronted with a complex and eventually impossible task. Moreover the inhab. were Vichy-ridden and, like the ill-equipped army, dispirited. It was soon realised, not least by the Brit. Gov., that no improvement was to be expected so long as Gen. Giraud's regime and Gen. de Gaulle's Fighting Fr. movement were at cross purposes. Through the efforts, however, of Gen. Catroux an agreement was reached on June 3, 1943, for the setting up of a Fr. Committee of National Liberation to direct the Fr. share in the campaign of reconquest, and also of a consultative assembly in Algiers and a unified administration for the Fr. Empire, soon wholly in the war on the allied side except for Indo-China, the possession of which Vichy had allowed to pass to Japan without a fight—a betrayal which bore bitter fruit in the Viet-Nam revolt in 1946-47. Gen. de Gaulle and Gen. Giraud shared the co-presidency of the committee for a time, but the anomalous duality was soon terminated, and Giraud devoted himself to the duties of commander-in-chief of the Fr. forces; these now included the Fr. fleet at Alexandria, which had joined the Allies on May 31, 1942, after having been neutralised since 1940. At this time too the forces were receiving adequate modern equipment from America and Britain. The committee's international status was not yet, however, recognised by the allied powers. More and more the administration in Algiers responded to the inspiration of the metropolitan movement, which continued to look upon Gen. de Gaulle as the guardian of its cause. Notwithstanding savage repression by the occupying Gers., and the apathy of Vichy, resistance inside F. grew. Wreckings increased, Gers. were shot, and traitors struck down. A remarkable enterprise was launched when thousands of young men, scheduled for deportation to Germany under an arrangement between Laval and Sauckel, Hitler's director of man-power, took to the maquis and maintained a sacrificial fight for freedom. Under the fraudulent label of *réfractaires*, however, many hundreds of thousands of Fr. workers, men and women, were transported to Ger. war factories, an outrage which was destined to react later on Laval with fatal consequences. By now Laval, though still expressing hopes of Ger. victory, had no real belief in such a result, while Pétain, at best a tragic figure, was compelled either by his captors or by force of circumstances to take less and less interest in the nation's affairs. Probably he had at last realised that the heart of the people was in the resistance movement. On March 19, 1943, Gen. Catroux, the Fr. delegate general in Syria, 'reclaimed the restoration of the free constitution of the Lebanon'; but soon afterwards a crisis arose over conflicting views on the continuing validity of the Fr. mandate and the dispute was

only settled at the end of the year. Both this incident and the equivocal attitude of the assembly in Algiers reflected the indisputable fact that at this time the Allies were still paying the costs of the comparative success of Ger. policy in F. If, however, the Gers. dreamed that they could win the Fr. people over to collaboration, that policy failed almost completely, and at the end of 1943 this bankruptcy of Ger. policy was so evident that even the Gers. hardly troubled to conceal the fact. Again if the Gers. believed that they could create in F. a

whom the Brit. and the Amer. Govs. still recognised. Thus a legal fiction was involved, and an important one; for it justified on one side an excessively cautious approach to Fr. problems by the Brit. and Amer. Govs., and it made necessary, on the other side, reluctance to commit a future F. at an inconvenient moment. The very fact that Gen. de Gaulle and his colleagues in Algiers regarded themselves as trustees for Fr. rights and Fr. sovereignty, but did not regard themselves as a sovereign gov., was one of the problems which created the



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pseudo-gov. which could be used as a cloak for controlling the Fr. Navy and Empire, and using them against Britain, that also failed. But Ger. failure was not complete, for the gov. of Vichy, if always feeble, did represent a Ger. success, however limited. For the creation in F. of a gov. which professed to accept Ger. leadership in Europe, and which professed to be able to protect Fr. interests outside Europe by its own diplomacy and its own arms, was a real success. It confused the issue inside F., inside Europe, and over a great part of the world, notably in the U.S.A., and for a time the national committee and the assembly did not claim to be a sovereign gov., and were, in fact, not recognised as a gov. at all. Yet it was quite certain that the committee had more authority inside F., and more serious chance of being the gov. of a liberated F. than had one or two of the exiled govs.

Lebanese crisis, or at least aggravated it. It had become evident that the Fr. national committee and the assembly were the spokesmen of a highly organised revolutionary movement, the resistance movement, and the Allies' recognition of the international status of the committee was therefore ultimately inevitable. (Prof D. W. Brogan.)

The following year (1944) saw the liberation of F. through the invasion by the Anglo-Amer. forces under Gen. Eisenhower, which were landed in Normandy on June 6. By early Sept these and other allied forces landed in the S. had overrun most of F. and expelled the Ger. Armies (see under WESTERN FRONT IN SECOND WORLD WAR). In many ways the political recovery of F. matched in swiftness and sureness her military rescue from the Ger. thrall. When in Dec. Gen. de Gaulle went to Moscow to sign a

treaty of alliance and mutual assistance with Marshal Stalin the act showed how far F. had advanced towards re-establishing herself as a great power. But the path had not been an easy one; and even up to the moment of the allied assault in Normandy Amer. and Brit. recognition of the Fr. Committee of National Liberation was still withheld, and the principles of the arrangements for the exercise of civilian authority in the liberated parts of F. remained to be settled. The consultative assembly in Algiers now adopted the title of Provisional Gov. for the Committee of National Liberation, and the National Council of Resistance, representing all sections of the patriotic movement inside F., issued an appeal for recognition of Gen. de Gaulle's administration. Two important changes took place: the first was that the Communists decided to be represented in the committee; the other was the supersession of Gen. Giraud as commander-in-chief and the assumption by Gen. de Gaulle of responsibility, Giraud being offered the post of inspector-general, which he refused. With the Allies firmly estab. in Normandy it was at once apparent that the authority of Vichy was not acknowledged by any large section of the nation. On the other hand, the resistance movement emerged as a vigorous fighting force commanding popular support. The movement was recognised by the allied supreme command as a regular combatant army and named the Fr. Forces of the Interior, and it co-operated with considerable effectiveness in the allied campaign in Normandy. The question of civil administration was not so easily settled; but after visits by Gen. de Gaulle to London and Washington an agreement was reached for the transfer of authority to the Committee of National Liberation, although in practice this had been done from the first day of the landings. The Fr. people gave Gen. de Gaulle a fervent welcome, and in Paris, where he was popularly acclaimed, he took firm control of affairs, and M. Lebrun, president at the time of the armistice, formally resigned. On Oct. 23, 1944, Great Britain, the U.S.A., and Russia recognised Gen. de Gaulle's administration as the Provisional Gov. of the republic. At the same time the greater part of F. was declared no longer a combat zone and was transferred to Fr. authority. The leaders of the Vichy regime disappeared into Germany or into hiding. As the Gers. and their Vichy collaborators saw their power ending in F. terrorism was intensified, and in four months, from June to Oct., hundreds of men, women, and children were massacred (see ORADOUR-SUR-GLANE). An official estimate of the total number of Fr. shot by Ger. firing-squads or killed in cold blood during the occupation is 29,660. After the liberation, a matter which gave rise to some protest, mainly from the Communists, was the decision to dissolve the *milice patriote* and other forms of the resistance movement. The gov. stood by the principle that the only armed groups must be the army and the state police.

Paris was physically undamaged in the war, but, on the other hand, no Eng. city, with the possible exception of Coventry, was smashed like Brest, Rouen, Lorient, Havre, and Caen. If Paris escaped other parts of F. paid a heavy toll in destruction. Unlike Britain, F. fed herself before the war, except for such luxuries as came from her colonies. During the war they were still able to feed themselves, theoretically, but the Ger. requisitioning and interference with transport resulted in the amount of food available for the people of F. being considerably less than the people of Britain received. The greatest physical suffering in Paris was due to the lack of coal. There was no private heating in Paris for four years. The average family was limited to a single small stove per apartment, in which they burned on the worst days such wood, charcoal, or low-grade peat as they could secure. Every one to some degree bought food and other things in the black market, where the prices were so high that the money had to come out of savings. People had to spend capital to maintain daily existence, with the result that the economic situation of the average Fr. person (excluding profiteers) was extremely poor, and Paris in 1944 was in the midst of an inflation which was tantamount to the liquidation of the middle class. Up to the time of the Anglo-Amer. invasion of F. the discipline of the Ger. Army was high, and the attitude of the Fr. people towards the Gers. was reserved and correct. But they hated the Gestapo, whose excesses and sadism were undeniable, and their greatest hatred was reserved for the 30,000 to 40,000 Fr. people who were active agents of Germany. The militia formed by Darnand as an auxiliary to the Ger. police was relentlessly pursued when the Fr. secured the upper hand.

A Constituent Assembly charged with the duty of drawing up a constitution for the Fourth Republic was elected in the following year (1945). The assembly's powers and authority were laid down in a law on which the people—women voting with the men for the first time in a general election—were required to give their judgment. The law was vigorously opposed by the Communists, who, apprehensive of Gen. de Gaulle's personal rule, wished the assembly to be unrestricted. The election, and the simultaneously held referendum, resulted in a vote of confidence in Gen. de Gaulle. The Communists returned as the strongest single party, closely followed by the Socialists and a new political organisation known as the Mouvement Républicain Populaire (M.R.P.). This last party drew its main driving force from the men and women who were in the resistance, and from Catholics who favoured large social and economic changes in the State; but it also derived support from the older parties of the right, which saw no political future in isolation. The prestige of the M.R.P. was enhanced too by its close association with Gen. de Gaulle himself. When the Constituent Assembly met, Gen. de Gaulle

returned to the people the powers he had exercised and, having been given a new mandate, formed a gov. drawn from the three main parties and pledged to a far-reaching programme.

Gen. de Gaulle resigned in Jan. of the following year (1946). His provisional gov. had denounced the constitution of 1940, and restored the Third Republic and its constitution, as in force in 1939. This *modus vivendi*, however, did not reflect the views of the majority of the people of F., and throughout 1946 F. was in quest of a new constitution. The reconciliation of a sovereign legislature with a stable executive was the stumbling block, though the seriousness of the country's financial position clearly pointed to the need for a strong gov. A first Constituent Assembly entrusted the task of devising a draft constitution to a representative committee, which produced proposals reflecting advanced democratic thought. They contained a preamble extending the revolutionary declaration of the Rights of Man, and set up a single sovereign chamber, flanked by two advisory bodies, the one political and the other economic; but though this draft was approved by a majority of the assembly it was rejected on a referendum (May). A second assembly was elected whose revised draft modified the more stringent provisions of the first draft. Under this constitution, which was approved in a referendum in Oct., a second chamber, the Council of the Republic, with members chosen by indirect election, was given a voice, though not a decisive one, in the legislation; while the president was to be elected by the two Houses in joint session. There were also provisions for revision of the constitution by adequate majorities, for the possible dissolution of the assembly, and for the political organisation of the Fr. Union—the new term for F.'s colonial empire.

In the Nov. 1946 elections, which created the first National Assembly of the new republic, the Socialists suffered severe losses, and fell to the third place among the three leading parties. The Communists were still the strongest single party, but the majority in the assembly was strongly anti-Communist. Both the Communists and the M.R.P., successively, failed to form a ministry, neither being able to do so without Socialist support and collaboration. Thus it seems that, in a parl. republic committed to extensive socialisation, the party of Jean Jaurès by some inherent logic succeeds to the natural leadership of F. Paradoxically when the Socialists dropped from second to third place, they strengthened their tactical position; for in the new conditions of equipoise between Communists and the M.R.P. they secured the vital position in the middle of the political see-saw, and it was in these circumstances that, on Dec. 16, the aged Léon Blum formed a purely Socialist gov., which he was able to do because neither of the other parties dared to jeopardise further the new constitution which they had combined to produce between them. Continued deadlock would, in their view, have played into the

hands of Gen. de Gaulle and right-wing elements who were incessantly demanding revision. That is why Léon Blum's single-party ministry received 575 votes. Thus fortified his stop-gap gov. launched a decisive attack on the price rise and on financial instability; sent out M. Moutet to attempt final settlement of the Indo-Chinese imbroglio; and, coming himself to London, went far to reach agreement with Great Britain on the settlement of W. Europe; and, above all, laid the foundations of a new Anglo-Fr. entente. Thus in six short weeks he had conspicuously justified the soundness of his political diagnosis in his study *La Réforme gouvernementale* (1936)—F.'s weakness of party discipline and lack of unified direction and leadership in Parliament and Cabinet. In short, he showed the difference between homogeneous cabinet-gov. and the old methods of *gouvernement d'assemblée*, or parl. dictation—the latter being equally denounced by Gen. de Gaulle. On Jan. 16, 1947, despite popular indifference to the choice of the first president of the new republic, the assembly, still in a mood of indulgence towards the Socialists, installed in office Vincent Auriol, a close friend and colleague of Blum and author of *Hier Demain* (1945), which expresses similar political views to those of Blum himself.

Blum resigned for reasons of health and was succeeded by Ramadier (also Socialist). The change of gov., however, did not interfere with the negotiations for a treaty of alliance with the United Kingdom and the treaty was eventually signed at Dunkirk (March 4). Ramadier's gov. was a coalition of nine Socialists, five Communists, five M.R.P., three Radicals, and four others. He rejected the demand of the Communists for the key portfolio of national defence, giving them the air portfolio only. The main features of the first four months of the year were the formation of the Rassemblement du Peuple Français (R.P.F., Rally of the Fr. People), the deterioration of the economic situation, and the deepening div. in the gov. between the Communists and the rest of the ministers. These three factors explain the development of political events during 1947. The R.P.F. was an organisation fostered by Gen. de Gaulle as a nation-wide movement of national union, and though he was attacked by the left, especially the Communists, of favouring the reactionary or Fascist elements, the movement constituted a new and popular force which materially affected the political balance in F., achieving a sweeping victory in the municipal elections. But meanwhile the economic situation was growing steadily worse and strikes broke out (Feb.) in the public services. Decrees were then issued reducing the prices of many articles and foods and special allowances were granted to workers; but the bread ration had to be reduced and meat could only be bought on the black market. The political situation was further weakened by the refusal of the Communists to vote the military credits required for operations in Indo-China and to suppress a revolt in Madagascar. This

div. of opinion, added to the social unrest, with strikes in the state-controlled industries, led to a wider split in the Cabinet, but Ramadier obtained a vote of confidence, except from the Communists, and new ministers replaced the latter. Though the most serious of the strikes now ended for the time, the task of keeping down prices and pegging wages remained, and in the summer, when the gap between wages and prices had grown still wider, strikes broke out which affected the railways and vital industries. Following negotiations between the gov. and the trade unions it was agreed (June 12) to resume work on the railways, but on June 19 bank employees came out. At this time the Treasury deficit stood at 126 milliard fr. Extreme measures were necessary and Schuman's plan to balance the budget included the abolition of all subsidies, except for coal, the reduction of gov. staffs to the 1938 level, a reduction of military credits, increases in taxes on capital and luxuries, including tobacco. This programme and the rising cost of living led to a fresh outburst of strikes, notably in the coal and iron industries, which were settled by the gov. announcing higher wages and a bonus on output for the miners and steel-workers. Ramadier secured a second vote of confidence, though both the Communists and the right-wing Parti Républicain de la Liberté (P.R.L.) voted against him—an odd collaboration between bitter opponents designed to thwart any measure introduced by a Socialist or Popular Republican minister. Political complications, however, further aggravated the difficulties of the gov., whose members collectively tendered their resignation to the Prime Minister. Ramadier then formed a new gov. of seven Socialists, three M.R.P., two Radicals and an Independent, which obtained a vote of confidence by a very narrow margin. Meanwhile strikes again broke out in essential industries, while Gen. de Gaulle denounced the Communists as 'separatists' who must be ousted from the Fr. community. The task of the gov. and the middle parties was to keep the balance between the Communists and Gen. de Gaulle's party and to that end they tried to create what they called the 'Third Force.' This was soon severely tested. A strike broke out in Paris and spread to Marseilles, paralysing all work in the S. and leading to serious riots. Further strikes then began in the N. coal-fields and among dockers and railway workers and by Nov. 24 nearly 2 000,000 workers were out. But the gov. handled the situation firmly, and many returned to work. While the crisis was reaching its climax the gov. resigned and Schuman (M.R.P.) succeeded Ramadier, with a Cabinet of six M.R.P., five Socialists, and two others. The new finance minister, Mayer, adopted drastic measures to check inflation, which included a super-tax on all incomes over 750,000 fr. This was adopted by the assembly (Dec. 24) by thirty-two votes only and the budget was balanced at nearly 900 milliard fr.

There were three changes of gov. between Jan. and Sept. in the ensuing year, showing that the country was more sharply divided than ever between Communists and non-Communists and that the 'Third Force' evoked by the Socialists and the M.R.P. had ceased to exist as an effective political factor, despite their majority within Parliament. This weakness of Parliament made the search for social and economic stability increasingly difficult.

The first gov. of Schuman fell on July 19. Like his predecessor Ramadier he was a victim of inflation. André Marie's (Socialist Radical) gov. lasted only a month, or just long enough for his finance minister, Paul Reynard, who had not been in office since 1940, to propose fiscal reforms which neither the Socialists nor the extreme right would accept. Schuman's second Cabinet (Aug.) lasted only a week and was succeeded by a coalition under Henri Queuille (Socialist Radical). Strikes for higher wages kept pace with the rising cost of living. A mining strike in the spring was followed in the summer by an outbreak of serious disorder among factory workers at Clermont Ferrand. In Oct. the coal-miners declared for a national strike of unlimited duration and were accompanied, at the beginning, with varying degrees of enthusiasm, by steel-workers in Lorraine and dockers. The coal-strike was evidently intended by the Fr. Communists, who continued to hold the loyalties of the workers in heavy industry, as a challenge to the gov. and to the success of the Marshall aid plan. Mines were occupied by the strikers who barricaded themselves to resist the police. The minister of the interior thereupon mobilised 40,000 conscripts, brought well-armed contingents of troops and police into the mining dists., and ejected the miners from the pits. Many ugly incidents occurred. While the Communists were manoeuvring their forces among the workers Gen. de Gaulle emerged as an open challenger to the republican regime in its present form. Some damage, however, was done to his cause when a few of his followers used firearms against Communists in a demonstration at Grenoble. But in Nov. his party was highly successful in election to the second chamber, the Conseil de la République. Meanwhile events abroad were overshadowed by the widespread fear in France that W. Germany, with Marshall aid, might appear once more as a dominant member of the European community. The recommendations on W. Germany and the Ruhr made by the six-power conference in London early in the year were received with many misgivings and Bidault, then foreign minister, was able to secure the assembly's approval only by 300 votes to 289, and then only with strong reservations. These misgivings were again voiced when the Brit. and Amer. Govs. announced (Nov.) that the ownership of the Ruhr industry would be handed to Ger. trusteeship; but the Fr. Gov. of Henri Queuille, which had assumed office in Sept., pronounced itself satisfied with the results of the Dec. conference on .

international control in the Ruhr, and agreed to the Statute of the Ruhr authority, and to the Occupation Statute for W. Germany. In co-operation with Britain and America negotiations with Russia continued. Progress in agric. and industrial recovery was steady in 1949, and departmental elections showed confidence in the Quenelle Gov. (See further under EUROPE, History).

It may be pointed out here that representative democracy has never worked smoothly in F. In the early period of the Third Republic the demand for a

The right wing asked for a revision of the constitution; President Doumergue, André Tardieu, reactionary leagues, spokesmen of the managerial élite of big business, stressed the shortcomings of the Fr. system, and urged a strengthening of the executive. But at that time, 1934-36, the left looked upon any attempt to change the constitution as an effort of the right to perpetuate its own power; Radical-Socialists fighting in the name of civil liberties and anti-clericalism, Socialists and Communists fighting on the ground of class opposition, joined hands to defeat



D. McLeish

THE HOSPICE OF GREAT ST. BERNARD

The district of Savoy in which the hospice stands was ceded to France by Italy in 1947.

revision of the constitution had come from the left wing. Radicals like Clemenceau attacked the Senate, some members of which could not be removed and which was the guardian of the decaying élite, made up of the Catholic hierarchy, the landed aristocracy, the army, and the old monarchist and imperial bureaucracies. They demanded drastic constitutional changes. But these republicans came to perceive that they could achieve their own ideals within the existing framework; they succeeded in democratising the Senate, in strengthening the chamber, and in submitting the executive branch to the relentless and sometimes tyrannic control of the local political machines, and of the parl. committees. The gov.'s power of dissolving the chamber, misused by President MacMahon, was practically abolished; and at the beginning of the present century the Chamber of Deputies emerged as the most powerful organ of Fr. democracy. Following the First World War the attitudes were reversed.

the so-called Fascist plots. Issues of political techniques were overshadowed by personal hatreds and group antagonisms. After the Second World War all parties wanted a revision of the constitution as it stood in 1939. But the new constitution, as passed in Oct. 1946, satisfied none of the parties completely. The Communists, and the Socialists tended to follow them, objected to the limitations imposed on the complete sovereignty of the National Assembly. The M.R.P. would have preferred stronger guarantees against possible excesses of the assembly's sovereignty. The parties who voted against the constitution altogether stood outright either for a system of checks and balances, or for a stronger executive. Gen. de Gaulle's criticisms were in line with those of the opposition, and he was also unequivocally in favour of the separation of powers after the model of the Amer. constitution. The central task before parliamentarians to-day is to shake off the traditions and ways of

thought which they have inherited from the Third Republic sufficiently to create, from the new material of strongly disciplined parties, a new type of parl. gov., which shall yield a stable and coherent administration.

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adequate number of troops to her E. front and overwhelm Russia whilst that country was still in process of mobilisation. The destruction of the Fr. forces was to be accomplished by the envelopment of their left flank and, as this would probably require the passage of a large force through Belgium, the violation of that country's neutrality (of which Germany herself was one of the guarantors) was duly provided for in Germany's plan. Such were the military factors which operated to make F. and F. the W. front during the First World War.

Germany declared war on France on Aug. 3, 1914, and it being early evident that the Gers. would violate Belgian neutrality, the Belgian Army was deployed to resist the invasion. On Aug. 4 Ger. troops crossed the border into Belgium and commenced an attack on the fortresses of Liège. This violation caused Great Britain to declare war on Germany, and the Brit. mobilisation was ordered at once. Gen. von Einrich (q.v.) was in command of the Ger. invading force, the Belgians being under the command of Gen. Leman. The Gers. could make little progress against the Belgians until they brought up their heavy howitzers. These quickly pounded the fortifications, which were unprepared for projectiles of such weight (see FORTIFICATIONS). Nevertheless the retarding effect on the Ger. force destined to envelop the Fr. left wing of the gallant Belgian defence contributed in no small measure to the eventual success of the Allies' cause in that it gave Great Britain time to transport her army to France and take up its position on the left of the Fr. line near Mons. By the third week in Aug. the Ger. Armies had overcome the Belgian obstruction and, pouring through unopposed, were threatening the Fr. left. Whilst the operations in Belgium were in progress, the Fr. and Ger. Armies had deployed, facing each other along the frontier. As a set-off against the Ger. advance on his left wing, Marshal Joffre (q.v.), the Fr. commander-in-chief, tried on Aug. 20 to penetrate the Ger. line on his right flank, about Sarrebourg and Morhange. The Fr. were defeated with heavy loss and driven back to the frontier. About the same time the Fifth Fr. Army, under Lanrezac, also sustained defeat at the hands of von Bülow (q.v.) commanding the Second Ger. Army at Charleroi.

von Kluck's Enveloping Manoeuvre.—With Metz as the pivot, the whole of the Ger. right wing was now making a great sweeping movement to envelop the Fr. left. As soon as Belgian opposition had been disposed of, the First Ger. Army, under von Kluck (q.v.), advanced rapidly and, by Aug. 23, was in a position which imposed a hasty retreat on the allied left wing to enable it to escape attack by overwhelming odds. At this time, however, thanks to the Allies' counter-espionage service, von Kluck was unaware that the Brit. expeditionary force (B.E.F., q.v.), under the command of Gen. Sir John French, was in position on the Fr. left; nor was this fact known at Ger. G.H.Q., where all were watching with feverish

excitement and premature joy the success of their plan as represented by von Kluck's movements. The B.E.F. was actually in the perilous position of having both its flanks exposed to an overwhelming adversary; for not only was von Kluck threatening its left, but, owing to the retreat of Lanrezac's Army, under pressure by Bülow and Hausen, its right was also 'in the air.' Notwithstanding these difficulties the Brit. 2nd Corp., under Gen. Sir Horace Smith-Dorrien, faced the Gers. at Le Cateau (q.v.) on Aug. 26, and not only held up von Kluck's victorious march, but also inflicted great loss on the Gers. A few days later Lanrezac checked von Kluck at Guise, but the vast superiority in numbers of the Gers. compelled the B.E.F. and Lanrezac's Fifth Army to retreat rapidly to avoid annihilation—a movement which exposed Joffre's left wing to attack. In order to avert this threat, Joffre threw back the whole of his line from Nancy to the left, and created a new army under Gen. Maunoury on the extreme left about Paris.

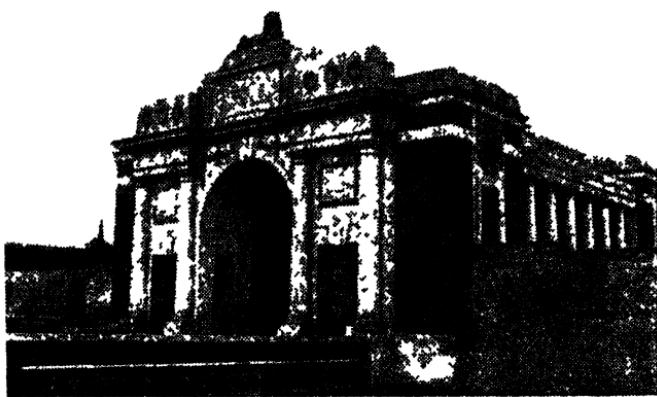
One of the decisive features of the war occurred when von Kluck's right flank reached the R. Somme about Amiens. Being under the impression that the B.E.F. had been annihilated, and in ignorance of Maunoury's new army about Paris, he changed his direction from practically S.W. to S., in order to envelop the Fr. left wing. When he arrived at the R. Oise he again changed to S.E., thereby leaving Paris some miles away on his right flank, which was exposed to attack by Maunoury and the troops of the Paris defences. As the envelopment of the Fr. left was now regarded as a certainty, the Gers. endeavoured to 'roll up' the right flank also and thus complete the destruction of the entire Fr. Army. To this end Prince Rupprecht tried to break through at Nancy but was heavily repulsed.

Battle of the Marne.—During the preceding few days Joffre had also formed another army under Foch, also towards his left flank, to fill up the gap in the retreating Fr. Armies. Joffre now waited until von Kluck had crossed the R. Marne, and then gave the famous order for a counter-offensive to begin on Sept. 6. Maunoury, whose Sixth Army had been rushed to the front in vast numbers of taxi-cabs and every other kind of vehicle, attacked von Kluck on his flank and rear, and forced him to recross the Marne precipitately and to face W. to meet this unexpected assailant. Foch held up von Bülow and Hausen. On Sept. 8 the B.E.F. pressed forward towards the Marne (see MARNE, BATTLE OF THE) in the gap between von Kluck and von Bülow, compelling the latter to retreat towards the Aisne. Von Kluck was ordered to conform to Bülow's movements, for otherwise he would have been completely isolated. This retreat was the deathblow to Ger. hopes of enveloping the Fr. armies. Eminent authorities on both sides consider these the most fateful days of the war, and it seems extraordinary that, although the Gers. were always given the greatest credit for possessing a wonderful

organisation for espionage, they knew nothing concerning the two most important features which led to the frustration of their plans, viz. the presence of the B.E.F. at Mons and the formation of Maunoury's army on their right flank.

During these early movements in the First World War the direction of the Ger. armies was under Gen. von Moltke, chief of the general staff; but his weakening of the Ger. right wing (by withdrawing from it troops to go to E. Prussia) before it had completed its task proved that he was not equal to the great name he had inherited, and he was removed from his appointment and succeeded by Gen. von Falkenhayn (q.v.).

opposite flank, but the Gers. countered this by bringing up reserves which completed the line to the sea. They also planned a 'break-through' in N. France in order to gain the Channel ports (q.v.), which would provide submarine and aircraft bases within easy striking distance of England. The Allies' line in this region was also strengthened, while offensive operations to test the strength of their opponents were maintained by both sides until Oct. 9, when the Gers. began the first battle of Ypres. This battle continued until Oct. 31, when the Gers. made a supreme effort to break through at Gheluvelt. Here the allied line was strung out to breaking point, but the



THE MENIN GATE

The gate erected in 1927 as a memorial to British soldiers killed in the Ypres salient during the campaigns in Flanders. It replaced the old gate reduced to ruins by German artillery.

Although the Ger. invasion had been arrested, and their right wing forced back, on the remainder of the front their line seemed immovable. The Belgian Army was still holding out at Antwerp (q.v.), to which tn. it had withdrawn after the fall of Liège, and being in rear of the Ger. right, was, although small, a force to be reckoned with as calculated to interfere with the Ger. communications. It therefore imposed upon the Gers. the necessity of detaching a force sufficient to guard against any offensive action it might be capable of taking. During its occupation of Antwerp the Belgian Army was reinforced by Brit. naval and royal marine brigades. The tn. fell on Oct. 9; the Brit. garrison reached Ostend, where it embarked for England, and the remnant of the Belgian Army escaped along the coast and eventually joined some Fr. marines holding the Yser at Nieuport.

The Race to the Sea. First Battle of Ypres.—The Gers. having been pushed back on his left, Joffre now intended to carry his counter-offensive round their

situation was saved by the Worcestershire Regiment, who filled a gap made by the Gers., and drove them back with great bravery, a feat which drew high praise from Sir John French. Although these operations, culminating in the first Ypres battle, virtually destroyed the *flute* of the Ger. Army, they also saw the end of the original B.E.F., the world-famed 'Contemptible Little Army.'

1915. *Trench Warfare.*—Up to this point the campaign had been conducted on the lines of open warfare or war of movement; but thenceforward it resolved itself into trench warfare, somewhat reminiscent of the Crimean war. During the winter of 1914-15 both sides were occupied in repairing their losses and preparing for the ensuing spring campaign. In Great Britain Lord Kitchener had become secretary of state for war, and had begun forming the new armies, the first of which he intended for dispatch to France by the spring of 1915. The W. front was therefore comparatively quiet after the first battle of Ypres.

British Attack at Neuve Chapelle.—**Poison Gas Used.**—The successes gained by the Russians on their S. front against Austria caused Germany to transfer troops from the W. to the E. front, and this circumstance led Joffre to decide to attack the enemy in Artois (*q.v.*). Sir John French launched an attack against Neuve Chapelle between March 10 and 13, 1915; but beyond improving the morale of the troops, which had been impaired by the period of stalemate during the winter, it achieved little. A month later an Anglo-Fr. attack was made about Ypres, in which the Gers. sprung a surprise by using poison gas for the first time. The gas was a mixture of phosgene and chlorine, the inhalation of which resulted in a painful death. The gases were released from cylinders and carried to the Allies' lines by a favourable breeze. Later they were enclosed in shells fired by artillery, a method which was clearly in contravention of The Hague Declaration of 1899. On this occasion the troops chiefly affected were the Canadian Div. and Fr. territorial and colonial troops.

Second Battle of Ypres.—Foch was in charge of the allied operations in this region, and another offensive was commenced on April 22, lasting until May 25 (known as the second battle of Ypres), but it failed to achieve any other result than to inflict enormous casualties on the Brit. forces, owing to their being massed in a sharp salient. The allied spring offensive proper or general offensive commenced on May 9 with the Brit. attack on the Anhers ridge. Here the Ger. defences were very formidable and no progress was made. Further S. the Brit. had also commenced the battle of Festubert (*q.v.*), and although the main objectives were gained, further allied action was held up by a shortage of shells, a circumstance which directly led to a political crisis in Great Britain and to the formation of a ministry of munitions. In the autumn further attacks were undertaken for political reasons in Artois, Champagne, and about Loos. These attacks were launched against the definite advice of Gen. Sir Douglas Haig, commanding the First Army (Brit.), there being, in his opinion, not sufficient ammunition available.

The Battle of Loos.—The mining centre of Lens was the final objective of the Loos operations, the main attack of which was along a 7-m. front about La Bassée. It opened on Sept. 25, following an artillery bombardment and a discharge by the Brit. of asphyxiating gas. One of the most violent operations was that connected with the capture of the famous Hohenzollern redoubt, situated just S.W. of La Bassée. The final result of the battle was that the allied line was advanced to the E. of Loos, thence N. to just W. of Hulloch. The Fr. attack in the Champagne (*q.v.*) was launched on Sept. 25; the Ger. positions were penetrated on a front of about 20 m. between Aubérive and Ville-sur-Tourbe. Fighting in this region continued until the end of Nov. These gains in ground, however,

were not commensurate with the great losses in men, the Brit. casualties alone, in the battle of Loos, being 50,000. One of the chief reasons why the Allies obtained no decisive result in this fighting was the lack of available reserves at the critical moment. The year 1915 was throughout a black one for the Brit. forces, who suffered over 280,000 casualties. The Fr. losses were not less severe, and it is small wonder that the Allies, as a whole, were in a despondent mood over the result of the year's operations.

Sir John French Superseded.—In Dec. Sir John French, who had fulfilled his difficult command with no little ability, resigned his appointment, the military authorities being dissatisfied with the progress made, and he was succeeded as commander-in-chief by Gen. Sir Douglas Haig (*see HAIG, EARL*). The magnitude of Sir John French's task was, however, enhanced by inadequacy of munitions, the lack of guns of heavy calibre, and the disparity between the numbers of his troops and of those opposed to him. During his command the Fr. military authorities had been responsible for the formulation of plans for the prosecution of the war on the W. front, the Brit. commander conforming thereto, and this system was maintained on the change of command. The distribution of Brit. troops was also in the hands of the Brit. authorities as theretofore.

Results of 1915 Campaign.—Generally speaking the Gers. were on the defensive during 1915, so that in the matter of defensive works and in experience in all things appertaining to defence they were considerably ahead of the Allies at the commencement of 1916. The provision of labour for unskilled work in and behind the lines was also an important factor; for, whereas the Gers. could call on the Belgians and inhab. of the occupied Fr. ter. to do forced labour in connection with their defences, thereby saving their troops such arduous and monotonous tasks, the Allies employed exclusively military labour, so that their combatant ranks were to a great extent depleted on that account.

In Dec. an inter-allied conference, presided over by Joffre, passed a resolution to the effect that a decision could be obtained only on those fronts where the greatest number of enemy troops was employed, a resolution inspired by the disastrous termination of the Gallipoli campaign (*q.v.*). The W. front was naturally one of these, and plans were accordingly made for an allied offensive on the Somme as soon as the new Brit. Armies (composed of 'service' or Kitchener battalions) were ready to take their place in the line.

1916. Battle of Verdun.—The first operation of consequence in 1916 was the battle of Verdun (*q.v.*). Von Falkenhayn, giving the reasons for the Ger. attack on this famous fort, states (*see his memoirs*) that in the first place it was hoped to deal an effective blow against England's chief ally and secondly to improve the Ger. strategical position in this area. His

opinion was that, as Verdun was situated at the angle of the Fr. N.E. and E. frontiers, and was less than 12 m. from the Ger. communications, it formed a powerful *point d'appui* for any action of the Allies against those communications, which if broken would render untenable the whole Ger. front in France and Belgium. Another important consideration was that such an attack would forestall the Allies' projected attack on the Somme. Twenty-five divs. were employed by the Gers., but even this colossal force proved insufficient to carry the forts. The Allies had early intimation of the intended move. The imminence of a Ger. attack at Verdun became apparent in the middle of Jan., and Gen. Herr, the Fr. local commander, reported that he considered the defences to be inadequate to withstand the strain. Gen. de Castelnau (q.v.) (chief of the staff) immediately went to Verdun to make a personal reconnaissance, and gave orders for certain works to be carried out which would strengthen the defensive area. There was not time, however, for these orders to be completed before the Gers. launched the attack. This was at 6 p.m. on Feb. 21, and on that day they gained Haumont wood and on the 23rd the whole of the first position ^w in their hands. On the 25th the Gers. occupied Fort Douaumont (q.v.), which the Fr. had failed adequately to garrison in spite of the importance which Joffre attached to it. Gen. Pétain was then placed in command of the operations at Verdun, with twelve divs. at his disposal. The first Ger. attack on the l. b. of the Meuse began on March 6, and although operations were continuous for nearly a fortnight they made but little progress. On the r. b. the Gers. were making desperate efforts to capture Fort Vaux to facilitate their general attack on the second line of defence; but in spite of the employment of unprecedented artillery bombardments and the use of liquid flame (*Flammenwerfer*) they failed to take the fort. In April Gen. Nivelle assumed command of the Fr. troops on the r. b., and the spirit of the offensive now imbued the Fr. A month later Nivelle was promoted to the chief command of the army of Verdun. Exasperated by recent reverses at the hands of Berthelot and Mangin (q.r.) the Gers. increased their efforts to secure victory on the l. b., but made no appreciable progress after practically a whole month's fighting.

The imminence of the Allies' Somme offensive was now beginning to weigh with the Ger. high command, and, in order to prevent Fr. reserves from being transferred to the Somme, the offensive against Verdun was intensified. The first week in June saw vigorous attacks launched against Fort Vaux, which resulted in its capture on the 7th. Another great Ger. onslaught commenced on June 23, and although active operations were maintained until Aug. 8 little advantage was gained. On Aug. 29 von Hindenburg succeeded von Falkenhayn as chief of the Ger. general staff, and he ordered all

offensive operations at Verdun to cease. On the Fr. side, however, Gen. Mangin had been largely responsible for the recent Fr. gains on the r. b. of the Meuse, and he at once planned the recapture of the lost forts. Operations were begun in Oct., and by the end of the year nearly all the lost ground had been regained. Verdun had an important bearing on the campaign; it was a great victory for the Fr. and a correspondingly disastrous defeat for Germany, whose armies could not repair the enormous losses sustained, in the abortive attacks, from the fire of the celebrated Fr. 75-mm. guns and mortars and, indeed, the influence of this crushing failure was felt by Germany to the end of the war.

The First Battle of the Somme.—The year 1916 also saw the great battle of the Somme (or first battle of the Somme) (see also SOMME BATTLES) which had as serious consequences for the Gers. as those of the Verdun battle. As previously stated this Somme offensive had been decided on at the end of 1915, but it could not be launched until the Brit. forces had been adequately reinforced. The object of the offensive was to obtain a military decision at one colossal blow. The offensive failed of its purpose; yet it effected much in exhausting the Ger. military resources. As succinctly stated in a pub. issued by the Ger. war records office, 'It would be erroneous to measure the results of the battle of the Somme by mere local gain of ground. Besides the strategic objectives, the Brit. and Fr. followed out a definite plan of exhausting the power of the defenders by the employment of great masses of artillery in constantly repeated attacks.' In addition to wearing down the Gers., it was necessary to arrest their progress at Verdun, and this could only be achieved by compelling them to transfer their reserves to some other and dangerously threatened point. But it would be erroneous to regard the Somme battle as a mere large-scale 'sympathetic' action; it was projected before the battle of Verdun, and without relation to the threat in that quarter: it was indeed hoped to secure by this sustained and co-ordinated advance on a 30-m. front a result which should have really decisive consequences. The relief of the situation at Verdun was a secondary and later consideration. The battle of the Somme saw two important innovations: (1) the invention of the 'creeping barrage' (see also BARACQ), of artillery fire by Gen. Horne, and (2) the employment of tanks (q.v.). It is also worthy of remark that the work of the allied air forces was of the greatest importance in this battle, in destroying enemy aircraft and in taking photographs of enemy positions.

The tactical objective of the Allies was the ridge N. of the Somme, extending through Thiepval, Pozières, Bazentin-le-Petit and Morval, beyond the Ger. line, for this ridge dominated the country towards Bapaume, and from it the allied artillery could command an extensive area. The general plan was to administer a succession of hammer-blows, alternately

Brit. and Fr., in order to distract the enemy, so that he might not know at what point to expect an attempt to pierce the line. The battle was carried out in three main phases. The first phase commenced on July 1, with an attack by the Brit. Fourth Army, under Gen. Rawlinson, between the Somme on the right and Gommecourt on the left. Although the attack was preceded by an artillery bombardment of unprecedented weight—shells being almost unlimited at this period—some of the Ger. defences were subsequently found to be still intact and many proved fully equal to the extraordinary pressure to which they had been subjected. This was due to the fact that the Ger. line here having been stationary for over eighteen months, the Gers. had spared neither time, labour, nor ingenuity in strengthening the positions. Localities which in 1914 were nothing more than scattered farmhouses and small vils. had evolved into formidable fortresses, so that at every step forward the Allies found evidence of the remarkable advances which science had made in field defences. On the left of the line attacked (*i.e.* from the Ancre to Gommecourt) the Allies made very little progress; but between the Ancre and the Somme, where the Ger. artillery were in less strength, a definite hold on the enemy positions was obtained in many places. The fighting on both sides was of the fiercest character, and the constant bringing up of fresh troops kept the tension at high pitch throughout the whole operation. The difficulties of supply, transport, communications, and evacuation of casualties were increased for the Allies the further they advanced, because, although their artillery fire had done its work effectively, it had at the same time destroyed the roads and other routes. After three days' fighting a 16-m. breach was made in the Ger. line, such places as Montauban, Mameitz, Fricourt, and La Boisselle falling into Brit. hands. On July 7 the Leipzig redoubt was captured, and four days later Contalmaison and Trônes wood fell. The attack was renewed on the Bazentin-le-Petit and Longueval front a few days later: then on July 16 Ovillers was captured and the Australians stormed Pozières on the 23rd. A few days afterwards Delville wood (*q.v.*) was captured, and on the 27th, after a tremendous effort and at great sacrifice on both sides, the first phase was concluded with the capture of Longueval. The Allies had broken through the first and second Ger. defensive systems, and between the Ancre and the Somme the allied line formed a great salient to the N.E.

The second phase began with an advance by the Fr. on the Somme coupled with determined efforts by the Brit. to improve their tactical position near the Ancre, about Thiepval and Pozières. The strenuous resistance of the Gers. had stopped the advance at this point, thus making a sharp angle in the Brit. line and also preventing the use of the Albert-Bapaume road. Moreover, guns at this point could enfilade the new Brit. line

about Bazentin and Longueval, so that a rectification here was essential to any advance further E. The highest point of the ridge had not yet been reached, so that visibility from the ground was still somewhat restricted, and although the Allies had gained the supremacy of the air in this region, security could not be assured until the ridge was wholly in their possession. A general advance was made by Brit. troops from Guillermont to Thiepval on Aug. 18. From the outset the fighting was desperate, particularly round Guillermont, which did not fall until Sept. 3. On the left of the line the Gers. tenaciously defended Thiepval, and many heavy counter-attacks were launched in their anxiety to hold this position at all costs. Ginchy was also the scene of much bloodshed, but eventually, the Brit. advance prevailed, and the place was captured on Sept. 9. Being now in possession of Guillermont, Ginchy, Delville wood, and Longueval, the Allies were on an equality with the Gers. from the standpoint of visibility and in a position to command Combles on their right and enemy positions about the Albert-Bapaume road on their left. The Fr. had, in the meantime, gained Cléry and Le Forest, and were winning back from the invaders their own ter.—a fact which heightened the morale of the troops. The Ger. resistance, however, N. of the Ancre was still not only sustained, but most costly to the attackers, who, in consequence, suspended the advance in this area.

The third phase commenced on Sept. 15 with an advance on a 6-m. front from Ginchy to Courclette. It was on that day that tanks were first employed in battle, and, speaking generally, they proved a failure at this stage of their development largely through foundering in the mud. They came, however, as a complete surprise to the Gers. although their construction and trial had been proceeding for some months previously. But if their performance on this occasion did not fulfil the expectations of those who, in the teeth of opposition, had advocated their manuf., they gave great assistance to the infantry by breaking up machine-gun nests and small posts which either had not been or could not be touched by artillery fire. This advance once launched it was found that the Ger. resistance was weakening; for many batches of prisoners were taken without a fight. On the left the Gers. were still holding stubbornly to Thiepval, but even here cracks were becoming noticeable in the defence, and when Pozières fell, and the victorious Brit. troops advanced beyond it, threatening Thiepval from the E., the Ger. line broke. On the right Combles was gradually becoming surrounded by the Brit. on the N. and the Fr. on the S., and by Sept. 26 the Fr. were in possession of the place. By the end of July the very definite angle at Thiepval had been flattened out, and the Allies' line ran along the lower N. and E. slopes of the ridge, so that their tactical objective had at length, but at great cost, been gained.

Battle of the Ancre.—In Oct. and Nov.

further offensive operations were undertaken by the Allies in order to realise more fully such advantages of position as were gained in the Somme battle. As previously stated Sir Douglas Haig could make little impression on the Gers. N. of the Ancre, about Gommecourt and Beaumont Hamel. He now decided to advance in this particular area—an operation known as the battle of the Ancre (q.v.). The Ger. defences, which had proved so formidable when tested the previous July, had been further improved as a result of experience gained in the course of the Somme battle. The Brit. began operations on Nov. 11 with two days' terrific bombardment, and on the 13th captured their first objectives. Steady progress continued to be made until bad weather brought the operations to a close on Nov. 19, by which time the Brit. line ran E. from N. of Beaumont Hamel and to near Grandcourt, Le Sars, Gueudecourt, and Sallly-Saillisel, where it joined the Fr. whose line ran S. to just N. of Péronne.

In contrast with 1915 the year 1916 ended on a note of optimism and confidence for the Allies. Their successes at Verdun and on the Somme, albeit costly and, in the nature of modern warfare, inconclusive, had, i.e. far towards establishing a definite superiority over the Ger. war machine and to hold out a prospect of ultimate victory.

Marshal Joffre Superseded.—In Dec. 1916 it had been agreed that in view of the appreciable gains on the Somme the Gers. should be given no rest throughout the winter and that the Somme battle should be 'continued' in Feb. 1917. Marshal Joffre advised that the Brit. troops should, in such event, be required to take an even larger share in the operations than heretofore. When this advice became generally known in the Fr. Army it provoked resentment, being interpreted as an aspersion on their valour, in the sense that the honour of taking the major part in military affairs in their own country was thenceforward to pass from the Fr. to the Brit. Army. The extreme tension in France at this time, coupled with the fact that the Fr. Army is never divorced from politics, affords an explanation of the readiness shown by many Fr. politicians during these deliberations to criticise Joffre's leadership and in that regard to find in his, his latest expression of opinion, grounds for discontent which they were not slow to exploit. The upshot was his supersession on Dec. 16 by Gen. Nivelle, who had become a popular figure by reason of his success at Verdun. That the moment was opportune for the resumption of the Somme operations would seem evident from the statement of von Ludendorff that the Gers. 'were completely exhausted on the Western Front' after the Somme battle, and were 'in urgent need of a rest' (*War Memories*). At the Ger. headquarters there was apprehension lest the battle should be renewed at points which would give them no time whether for recuperation or for the accumulation of material.

But although, as already stated, it had been agreed among the allied commands that the enemy should be given no rest throughout the winter, this agreement was now ignored. The relations indeed between the allied higher commanders were not at this time the most cordial. Nivelle had prepared a plan which presupposed that Haig should be placed under his orders. To his astonishment Haig found that this plan had been acquiesced in by the Prime Ministers of both Great Britain and France. It was, however, eventually agreed that the Brit. Army should be 'regarded as allies and not subordinates by Nivelle.' This agreement was not reached until the middle of March, with the result that the enemy obtained the respite of which he was in such sore need. During this valuable interval the Gers. had been preparing a new defensive system from La Fero on the R. Oise to Arras on the R. Scarpe—a line which gained notoriety among the troops as the Hindenburg line (q.v.). This new line was some miles in rear of the area covered by the Somme offensive of 1916, a point which is to be borne in mind in the light of subsequent events, and particularly Nivelle's supersession by Pétain.

1917. German Retreat to the Hindenburg Line.—The operations on the Ancre, which were brought to a close in Nov. 1916, were opened again in Jan. 1917. The Gers. fell back from the confluence, and Gen. Sir Hubert Gough (q.v.), who was in command of the Brit. troops in this area, ordered the attack to be pursued with all possible speed. On Jan. 11 the Brit. captured a spur N.E. of Beaumont Hamel, which enabled them to command the entire Beancourt valley and the W. slopes of the spur beyond the valley, from Grandcourt to Serre. Operations were at once begun to clear the remainder of the valley S. of Serre hill, and to push the line forward to the crest of the spur. On the night Feb. 3-4 an important Ger. line on the s. slopes of this spur, forming part of the enemy's original second-line system N. of the Ancre, was captured after desperate fighting, and by Feb. 5 Gen. Gough had gained his objective. On Feb. 7 the Gers.' great withdrawal to the prepared Hindenburg line began. In some cases ins. were evacuated without any fighting, but in others key positions were defended with the enemy's usual tenacity. By Feb. 17 Miramont, N. of the Ancre, and Baillecourt farm, S. of the riv., were taken. On Feb. 25 the Gers. fell back about 3 m. on an 11-m. front, leaving Serre, Pys, and Warlencourt in Brit. hands. On Feb. 28 the strong Ger. pivot of Gommecourt was captured. By March 10 the important position of Irles fell, and three days later the enemy abandoned his main defensive position on the Rapaume ridge. Here the Brit. drove in his rearguards and occupied Grévillers and Loupart wood. Rapaume fell on March 17, and by the 18th the Gers. were in full retreat from Soissons to Monchy. A rapid Brit. advance gave them Nesle, Chauvincourt,

Péronne, while further S. the Fr. captured Damery and Noyon. The Ger. retreat was a confession of defeat and of inability to withstand the allied artillery, which had now gained a definite ascendancy; but all the arts of the propagandist were employed in Germany to interpret the retreat as the most masterly of strategic movements. The methods of destruction which accompanied the retreat betrayed the characteristic savagery or ruthlessness of the Ger. military doctrinaires. Almost every building and tree was destroyed; mines and every kind of death-trap were prepared with inhuman ingenuity. Such devices delayed the pursuit, and it was not until the allied armies had reached the Hindenburg line, and the pressure became general, that they could develop plans for the future conduct of the campaign.

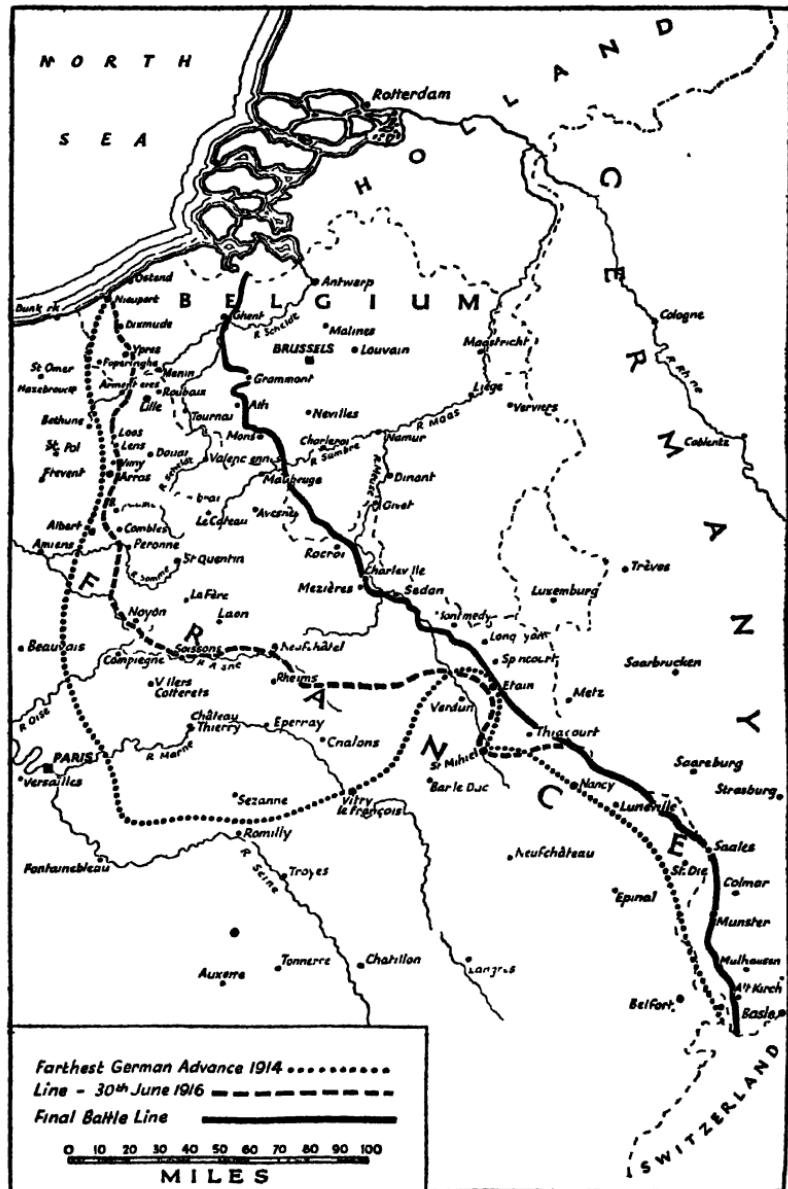
In Nivelle's original plan for an offensive he had allotted to the Brit. forces a front which included the area from which the Gers. had withdrawn. It was naturally expected that the Ger. retreat would necessarily profoundly modify this original plan; but Nivelle decided to make no change. This decision raised misgivings over his capacity for leadership and, coupled with his failure to break through with the Fr. Army on the Aisne between April 16 and 20, practically decided the Fr. Gov. to supersede him. This was effected on May 15, when Pétain became commander-in-chief of the Fr. Armies. At this time the morale of the Fr. troops was not at its highest: the failure on the Aisne had brought about widespread dejection; defeatism (see CAILLAT X; ET HOPE; MALVY) was preached everywhere, and mutinies broke out in several places. Pétain set to work to eradicate these evils, and through manifest defects in the Ger. military intelligence their existence was never suspected at Ger. headquarters. In order to keep the Gers. occupied while the reconditioning of the Fr. Army was in progress, Gen. Haig was asked to continue the battle of Arras, which had been commenced on April 9 (see ARRAS, BATTLE OF).

Battle of Arras.—The battle of Arras had for its purpose the removal of pressure on the Fr. in Champagne, so that Nivelle's plan for breaking through the Ger. line could be accomplished. The original objectives were the Vimy ridge and Douai. The ridge was brilliantly captured by the Canadian troops and, generally, the advance was successful at all points during the first few days. The bitter struggle for Lens opened on April 14, the environs being reached only after the sternest fighting. After a short pause the battle was resumed on April 23, on both sides of the Scarpe, E. of Arras. Here the pressure increased owing to the bringing up of Ger. reserves. Progress E. of the Vimy ridge was also made between April 28 and May 3. On the latter date, following a great spurt, the Canadians captured Fresnoy. By the beginning of July the Allies' line had been advanced in this region to just W. of Lens, thence S. to Chérisy. The battle of Arras had already begun on June 7,

the signal for which was the explosion of nineteen huge mines under the Ger. line. Gen. Plumer's Second Army carried out the attack, which was launched at 3.30 a.m. The Messines-Wytschaete ridge was stormed, and, before noon, both Messines and Wytschaete were captured. In the afternoon Oosttaverne was taken, together with its rearward defences over a 5-m. front, and some 5000 prisoners. Further progress was made on June 12 E. and N.E. of Messines.

Third Battle of Ypres.—Passchendaele.—On July 31 a series of operations commenced known as the third battle of Ypres, which had for their primary purpose the driving of the Gers. from their bases on the Belgian coast so as to thwart their submarine campaign. The secondary purpose was to ease the pressure on the Fr. further S. Progress was made S.E. of Ypres, and particularly on the N., where St. Julien and Pilckem were captured, thereby depriving the Gers. of the ridge from which they commanded Ypres. After the first onset, however, bad weather set in, which made movement impossible. The attack was resumed on Aug. 9, and in the first week the Brit. captured Langemarck. The Fr. troops on the left had also made some progress and had captured Graschten. General progress continued E. and N.E. of Ypres until Aug. 27. Three weeks later the battle was resumed along the Menin road, and particularly heavy Ger. counter-attacks were repulsed on Sept. 22. A few days later the Brit. cleared Polygon wood and stormed Zonnebeke. Again the Gers. heavily counter-attacked, but were repulsed with the heaviest losses. On Oct. 4 another push was made from E. of Ypres to Langemarck, where all tactical objectives were gained. On Oct. 9 a great combined Franco-Brit. attack was made N.E. of Ypres between Passchendaele and Hout-hulst forest. The Canadians gained the rising ground S. of Passchendaele by the 26th, and the Fr. advanced along the Bixschoot-Dixmude road and captured Luyghem. After very gallant fighting the Canadians captured Passchendaele on Nov. 6, and the protracted battle closed with the Franco-Brit. positions well advanced N., E., and S.E. of Ypres. Over 20,500 prisoners were taken, together with 55 guns.

British Attack at Cambrai.—The Gers. were given very little respite before the Brit. Third Army, under Gen. Byng, attacked them on Nov. 20 near Cambrai. The Gers. had at this time been pressing hard on the I.t. front with troops drawn from the W. front, and the battle of Cambrai was designed to stop the transfer of Ger. troops to that front. The battle is particularly noteworthy for its novel opening, in that the usual artillery bombardment was dispensed with, tanks being employed instead (see CAMBRAI, BATTLE OF). This new method had the advantage of not apprising the enemy beforehand at what point or when the attack was to be made. This revolution in tactics was completely successful, and a deep penetration was made into the



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strong Ger. positions for 5 m. on a 10-m. front. The prisoners taken numbered over 10,000. Among the places captured were La Vacquerie, Flesquieres, Marcoing, Havrincourt, Grancourt, Anneux, and Ribécourt. The next day the Brit. line was advanced S. and S.W. of Cambrai. The important position of Bourlon wood still remained in Ger. hands, and owing to its strategic value, in dominating as it did the battlefield in this area, its capture was of the first importance. Hence on Nov. 23 a large number of tanks, supported by infantry, were launched against it, and by nightfall it had been taken, although the vil. still remained with the enemy. Heavy Ger. counter-attacks, however, succeeded in regaining Bourlon wood for the enemy, and the Brit. were withdrawn to a less exposed line. Over 11,000 Ger. prisoners and 145 guns were taken, the Ger. casualties being in the neighbourhood of 100,000.

Results of 1917 Campaign.—Thus ended the year 1917 on the W. front, where the allied armies had not only made deep inroads into the Ger. line, but far deeper into their man-power. Nevertheless, owing to the Russian Revolution and the elimination of the Russian armies as a fighting force, the Gers. were rapidly building up their forces on the W. front with accessions of troops from the E. France had reached the limit of her reserves, and Great Britain was approaching that point. The U.S.A. had, however, declared war on Germany, and it was to this source that the Allies looked with confidence for that necessary increase of strength which would bring the war to a victorious conclusion. The control of the war on the Allies' side entered a new era when, as a result of the defeat of the Its. in Oct. 1917 (see CADORNA; CAPORRERO), a conference of allied ministers took place at Rapallo on Nov. 6, at which it was decided to set up a supreme war council at Versailles with military representatives to advise it. Gen. (later Marshal) Foch was appointed president of the military representatives, and was given executive power. Difficulties, however, arose at once, as the new council was not popular with the commanders-in-chief. The Brit. were asked to take a larger section of the front from the Fr., and, in spite of protests from Sir Douglas Haig, the Brit. front was increased.

1918. German Preparations for Final Offensive.—As in the winter of 1916-17, so now a change of command brought misunderstanding and delay in offensive action, during which interval the Gers. were preparing for their great and final offensive in the spring of 1918 on the W. front. Their most important consideration was at any cost to defeat the Allies before the Amer. troops arrived to reinforce them. As early as Nov. 1917 Ludendorff had decided that 'the British must be beaten', and schemes were formulated to achieve that end. The most extraordinary precautions were taken to ensure secrecy, for success depended on surprise. No change was made in the troops holding the front nor were they told of the pro-

jected offensive. Troops for the assault were assembled well in rear of their line, and all large movements were carried out at night. A number of officers were detailed for the special duty of ascertaining from aircraft whether any signs, common to preparations for an offensive, were likely to be observed by the Allies. In this they were aided by weather conditions, which were such as to preclude the taking of photographs from the air for some weeks prior to the launching of the assault on March 21, 1918. On this day the Gers. attacked on a wide front from La Fère on the S. to Arras on the N. They employed over sixty divs., two-thirds of which were opposed to Gough's Fifth Army, which was covering Amiens, the remainder being launched against Byng's Third Army, which prolonged the line northward. The Fifth Army was widely strung out, and being opposed by such overwhelming numbers, was forced to withdraw. On the other part of the front the Gers. met with such obstinate resistance that little progress was made.

Second Battle of the Somme.—The Gers. attacked in massed formations, and their casualties were on a colossal scale. Before the offensive had opened the Brit. and Fr. commanders-in-chief had come to an agreement that if one were attacked and not the other, the latter would send reinforcements to the former. Although the attack was launched with the object of 'beating the British,' Ludendorff changed the whole plan as soon as he learned that his Eighteenth Army (von Hindenburg) had gained a tactical victory over the Brit. Fifth Army, which was in touch with the Fr. He now wished to exploit this victory and separate the Brit. and Fr. Armies by driving in a wedge between them. He proposed to do this by rapid advances on both sides of the Somme. He ordered the Fourth, Sixth, and Seventh Armies to attack the Brit. N. of the Somme, 'in order to drive them into the sea'; and further ordered that, 'S. of the Somme, the operation was to be carried out offensively against the Fr. by a wheeling movement into the line Amiens-Montdidier-Noyon, followed by an advance south-westward,' direct on Paris. Whilst the Allies were thus being separated the Ger. Second Army was to march on Amiens on both sides of the Somme. In view of the threat to Amiens, it was found impossible for Pétain to carry out his promise to Haig, although the latter was heavily attacked on a 50-m. front. This lack of co-ordination between the Fr. and Brit. in their efforts to resist the Gers. was calculated to lead to the most serious consequences, and it was in these circumstances that Foch was given the necessary powers to co-ordinate these operations. He at once began to exercise his personal influence over the various commanders, and to such good effect that the Gers. were brought to a standstill on the line Ois-la-Aire by April 4, and touch between the two armies was maintained. This inastirous strategy unquestionably relieved a most menacing situation. Before this date, however, the original scope of the

Ger. attack had been widened again so as to include the terrain as far S. as the Aisne. In this connection it may be noted that Gen. von Kuhl, in a report to a committee of inquiry set up by the Ger. Gov., says categorically: 'The offensive power of the Gers. was no longer sufficient for all these tasks, as was soon proved.'

The Battle of the Lys.—The Threat to Amiens.—The second Ger. offensive was launched against the Brit. on the Lys. For some time it had been apparent that an attack was in course of preparation in this area, the evidence being gathered mainly from air photographs. According to Gen. von Kuhl the ultimate decision to attack at this point was not made until April 1. Final intimation of the coming blow was not received until April 7, when, through a Ger. prisoner it was learned that the attack was timed to commence on April 9 (Ludendorff's birthday), which proved to be the correct date. This warning was very opportune to the Brit., for it gave them time to move their reserves into a selected position. Compared with the first or Somme offensive it would seem that the Ger. high command did not intend this later offensive to be on so large a scale, as they employed only seventeen divs. Prince *Wurtemberg* was in command, his objective being Armentières in the Ypres sector, as a stepping-stone to reaching the Channel ports. It was therefore essential for the Brit. to defend *à outrance* every foot of ground. The Ger. pressure was, however, as overwhelming as in their first offensive, and gradually they gained ground, although at great cost. One very important gain was Kemmel hill, which they took on April 25, but all attempts to pierce the Ypres defences were vigorously repulsed. Further S. the Gers. made desperate efforts to reach Amiens, but their way was barred at Villers-Bretonneux by the Australians, who fought with great gallantry. At Givenchy and Festubert, on the left of the Lys offensive, the Gers. suffered a severe reverse. In his memoirs Ludendorff significantly states: 'On the left at Givenchy and Festubert we were held up. The result was not satisfactory.' This occurred on the day the offensive began. On the Brit. side this part of the line was held by the 5th (W. Lancashire) Div. of territorial soldiers, and the attacking troops were the 4th *Ersatz* Div. The tactics employed by the Gers. were those of the successful infiltration type. A divisional order of the Gers. stated that their artillery would prevent the Eng. from using their reserves. It also contained some contemptuous observations on the fighting qualities of the Brit. troops holding the line, by way of stimulating the attacking troops. However, in the result not a yard of the Brit. position was lost, whereas over 750 Ger. prisoners and seventy machine guns were taken. The Ger. reserves were crowded three-deep in trenches just in rear, and these were killed almost to a man by Brit. artillery. Fresh reserves sent up in support could not find cover in the trenches already filled with their dead comrades, and so met the same fate above

ground. So confident of success had the Gers. been that they had their bands with them, and musical instruments littered the field for weeks afterwards. The Brit. had held their ground by small self-contained posts, organised for all-round fire with intervals well lacquered with barbed wire. Independent platoon counter-attacks had completed the Ger. confusion. This system of defence was found to be the most effective counter-move to the Ger. system of infiltration tactics. As a set off against this disaster the Gers. had occupied the Messines-Wytschaete ridge and the outskirts of Armentières and Merville. It was during these fateful operations that Sir Douglas Haig issued his famous order: 'Words fail me to express the admiration which I feel for the splendid resistance offered by all ranks of our army. With our backs to the wall, and believing in the justice of our cause, each one of us must fight to the end.' Foch had been made commander-in-chief of the allied armies in France and Flanders on April 14 with power to direct their strategical movements, but not their tactical handling. During the third week of April the Ger. supply system became faulty, and Prince Rupprecht asked for permission to break off the battle, to which Ludendorff agreed. It was later discovered that Ludendorff was losing heart because 'the second grand attack had not brought the hoped-for decision.'

Final German Offensive Endd.—On April 30 all movement came to a standstill. In March and April the Brit. Army had suffered terrible losses, their casualties amounting to 303,000, including over 28,000 killed. None the less, Foch's confidence in the Brit. Army remained unimpaired.

The third phase of the last Ger. offensive of the war was now being considered. Ludendorff was still of opinion that the Brit. must be beaten, but he could not do this until the allied reserves had either been destroyed or attracted elsewhere. It was therefore decided that the Fr. should be attacked by the Crown Prince William on the Chemin des Dames (*q.v.*) in order to draw off the allied reserves from the Brit. front. In the operation order of May 1 Ludendorff stated: 'The object of the attack is to loosen the present united allied front opposed to Crown Prince Rupprecht's group of armies and to create thereby a renewed possibility of a successful continuance of the offensive against the British.' Although the Gers. had plenty of ammunition, they were feeling the want of men both in quantity and quality. Thirty divs. took part in this attack, twenty-six of which had already been employed in previous assaults. The attack opened on May 27 between Rheims and Soissons. It took the Fr. entirely by surprise, and was completely successful, penetration being made on an 18-m. front, and within a few days the Marne was reached between Dormans and Château Thierry. Designed merely as a diversion, it had become a great battle. It was, however, brought to a standstill on

June 5, but not until it had, in the words of von Kuhl, 'gone fatally too far,' for nothing more than a great salient had been created in the Ger. line. They had, however, captured 50,000 Fr. prisoners and 500 guns. On June 9 the Gers. launched an attack against Metz, but owing to stubborn resistance it soon subsided.

The topographical result of these offensives of 1918 was the creation of deep salients in the Ger. line, and there were divided counsels at Ger. headquarters regarding the further action to be taken. Some thought it advisable to go back to the positions held before the first offensive on March 21, but before any scheme could be finally decided the Allies had seized the initiative and launched the counter-offensive which brought the war to a close.

The Final Allied Offensive or Advance to Victory (July 15 to Nov. 10).—In the great allied offensive battle of 1918, or rather series of battles, two periods may be distinguished: the first (July 15–Sept. 28), during which the allied high command baffled the enemy's attacks, began to strike in its turn, and forced the enemy to put himself on the defensive; the second (Sept. 26–Nov. 10), when the Allies passed to the general offensive, hit the enemy without respite on the entire front from the sea to the Meuse and so exhausted him that he was compelled to ask for an armistice in order to escape the disaster which the next succeeding attack would have brought on him without hope of being in a position to reply.

The first period comprises the second battle of the Marne; the battle of Picardy. The second, the battle of Champagne, the battle of Cambrai, the battle of Flanders.

The nomenclature of these battles is that of the Fr. general staff. In Eng. records the prin. battles fought during this period by the Brit. Armies are known as the battle of Amiens, Aug. 8–12; battle of Bapaume, Aug. 21–31; battle of Arras, Aug. 26–Sept. 3; battle of Epéhy, Sept. 18–19; battle of Cambrai–St. Quentin, Sept. 27–Oct. 10; battle of Ypres, Sept. 28–29; battle of Courtrai, Oct. 14–31; battle of the Selle, Oct. 17–25; and the battle of Maubeuge, Nov. 1. The last Ger. offensive, as already indicated, was in the middle of July, when the Gers. began an assault on the Fr. on a front of 55 m. E. and W. of Rheims, their right wing operating on the line of the Marne. From the Fr. side the right of the attack stretched from the vil. of Prunay, E. of Rheims, to the hills known as the Malu de Massiges, just W. of the Argonne forest in the Champagne. The left extended from Fossoy vil., S. of the Marne and E. of Château Thierry, to Coulommiers vil., S.W. of Rheims.

As far back as June 12 the rush of the Ger. Armies on Villers-Cotterets on the one side and on Compiègne on the other was stopped. But everything led the high command to suppose that the enemy, after a period of rest for reconstituting his reserves and supplies, would undertake a fresh and powerful effort. Foch was in a position to know at every moment

the precise strength of the Ger. Army, to follow its progressive wastage, and to adapt his decisions according to the enemy's situation. At the end of June the Ger. Army was estimated to comprise a total of 207 divs.: 130 in line, seventy-seven in reserve, of which thirty-one were fresh, twenty-six reconstituted and twenty fatigued. It was at first believed that the enemy would attack on the Brit. front, and that the attack would be before the beginning of July; but by July 10 it was clear that the prin. assault would be in Champagne. The Fr. Army, reinforced by divs. of young Amer. soldiers, awaited in confidence the expected attack, and Foch already saw in the 'attack for Rheims' a favourable occasion for turning to the offensive.

From the opening days of July Foch decided to deliver a counter-attack on the front between the Aisne and the Ourcq, this counter-attack to be combined with a second attack on the opposite side of the Château Thierry 'pocket,' so as to close this pocket, or at all events to compel the enemy to evacuate it. At the same time a counter-offensive in E. Champagne was contemplated, to be delivered on the E. flank of the main Ger. attack in the event of the Gers. making progress southward. With this end in view, forces were concentrated to the S. of the Argonne. On the same day that the Ger. divs. set out towards the starting points of their assault, allied divs. were concentrating to attack them in flank. This was the first time the Allies had acquired the initiative over the Ger. command. Thereafter they kept it throughout.

On July 14, of the eighty-one divs. of the enemy thirty were disposed behind the troops in the sector from Château Thierry to the Argonne; and on the morning of July 15 they too combined in the assault.

In the Champagne the Ger. attack gave way in front of the foremost Fr. positions; between Rheims and the Marne it was repulsed in front of the second positions; to the S. of the Marne it secured a foothold on the heights between Jaulgonne and Dormans, forming a pocket from 6 to 8 kms. in depth. Throughout July 16–17 the enemy's whole effort was directed towards Epérnay; but, counter-attacked without cessation, the Gers. could make only slight progress. From the evening of July 17 their advance was completely held up. Instead of breaking the Franco-Amer. front and forming a vast pocket in Champagne and Brie, the enemy's attack resulted in nothing better than tactical successes of a purely local character, successes which in no way compensated him for his heavy losses. Moreover, the situation, as a whole, of the Fifth and First Ger. Armies, was not improving: the troops which had crossed the Marne were in a precarious situation; for they were threatened with the chance of being flung back across the riv. at any moment, while their supplies could only be brought up over bridges which were being incessantly pounded by the allied artillery and airmen.

The French Offensive begins on the Marne.—On July 18 the Ger. command began to be conscious that they were defeated. It was at this precise moment that Foch launched the offensive with the Tenth and Sixth Fr. Armies. (The enemy was fearful of this offensive and there are in the possession of the Fr. general staff numerous documents establishing this apprehensiveness.) The Tenth Army at one rush reached the approaches to the road from Soissons to Château Thierry. The result of this success was that the knot of roads from Soissons, the branch railroads from Nissy-sur-Aisne over which

were continually compelled, by reason of the extraordinary tenacity of the allied attacks, to engage new units. From July 18 the high command had to call for reinforcements from all parts of their front—Gen. Gallwitz had to dispatch three divs. and the crown prince of Bavaria six. This was not sufficient, for the tired divs. which had delivered the attack in Champagne on July 15 were called upon for a fresh effort, while orders were given to countermand the attack projected against the Brit. in Flanders. (This appears from a secret order of the Fourth Ger. Army dated July 22.)



Topical Press

LORD HAIG, GENERAL WEYGAND, MARSHAL FOCH, AND KING GEORGE V.
ON A VISIT TO THE BATTLEFIELDS AFTER THE WAR

were passing the supply columns for the masses of enemy troops congested in the Aisne-Marne loop, fell under the fire of the Fr. guns. The Fifth Army, assisted by the It. Army Corps, took up the offensive between the Marne and Rhoësme, in liaison with the operations of the Tenth and Sixth Armies. Thus both flanks of the enemy's line were shaken, and the Ger. high command saw that they could no longer engage battle in the pocket, where their communications were threatened. Yet the exigencies of the conflict compelled them to fling fresh divs. into it every day. Thus the Ger. command, who but four days previously were rushing to the attack, found themselves constrained to submit to the will of their adversaries, and, in these circumstances, ordered the retreat.

The Beginning of the German Retreat from the Marne.—The retreat was slow and ineffectual, but was very costly, by reason of the fact that in order to save the great accumulation of material and stores between the Marne and the Aisne the Ger.

On July 19 the Gers. had recrossed the Marne. Before the incessant attacks of the Fr. and Amer. troops they were falling back by the 27th on the Ourcq; and on Aug. 4 they were on the Vesle. Things had therefore gone directly contrary to the Ger. plans. The Ger. front, instead of forming a threatening salient in Champagne and Brie, had been pushed back on the Aisne and Vesle; while the Fr. reserves, far from being employed exclusively in stopping up the gaps in the allied front, had assumed a brilliant counter-offensive; and only a very small part (two divs.) of the Brit. reserves had up to this time been employed in the battle. The reserves of the Bavarian crown prince, on the other hand, were perforce rushed down precipitately from Lille towards the Aisne. Finally the Ger. command had to renounce its cherished plan of an offensive in Flanders, and it was thenceforth open to the Allies to assume the initiative in a new battle between the Oise and the sea.

The Battle of Picardy.—Marshal Foch, in order to retain the initiative and to

leave the enemy no opportunity of recovery, perfected his plans for delivering separate attacks in as rapid succession and with as large an element of surprise as possible, to the end that he might bring about the progressive disorganisation of the enemy's armies—and to continue in this manoeuvre until such time as he should order a general attack upon the whole Ger. front. Having verified the fact that, as from July 12, the enemy was maintaining in line between the sea and the Oise tired troops of poor quality, Marshal Foch meant to derive every advantage from this weakness by undertaking important offensive actions; and he accordingly directed the attention of F.-M. Haig to the Festubert-Ribécourt front, an attack on which would allow of the liberation of the mining basin of Bruay. He planned, in addition, a joint and simultaneous operation by the Fourth Brit. Army (Gen. Lord Rawlinson) and the First Fr. Army on the Amiens salient in order to free the Paris-Amiens railway; and finally he arranged for the Amer. attack for the flattening out of the St. Mihiel salient. So that the counter-offensive of the Marno was hardly organised and set in motion before three other distinct operations, each on a large scale, were in course of preparation.

On July 23 the Fourth Brit. Fr. Armies attacked on a 15-m. front astride the road from Amiens to Roche and between Albert and Moreuil. In forty-eight hours they had advanced over 10 m., reached the outskirts of Chaulnes and Quesnoy and were threatening to outflank the Eighteenth Ger. Army from the N. On Aug. 10 the Ger. Army began to fall back on the 1917 positions between Chaulnes and the Oise, but, surprised by a sudden attack by the Third Fr. Army, it executed the movement in disorderly haste. By Aug. 15 the Ger. troops were back once more in their 1917 positions on the Chaulnes-Ribécourt front, and thus, within the space of a month, the Allies had reduced the two biggest salients of the enemy's line—the one towards Paris, the other towards Abbeville—the two great objectives of the Ger. in 1918.

A serious drain had now been made on the Ger. Armies, but the Amer. Army was not ready to attack at full strength. Hence Foch, instead of pressing the Albert-Oise front, where the enemy had not been sufficiently shaken in his solidly organised positions, carried the attack on the Ger. wings and notably on the N. wing, where the enemy's reserves were known to be diminishing. Whilst the First and Third Fr. Armies were tenaciously engaging the enemy to prevent him from drawing men from his centre, the Tenth Army was ordered to attack in the direction of Chauny so as to outflank the massif of Noyon-Guiscard-Tergnier, the Third Brit. Army (Gen. Byng) prepared to attack in the direction of Bapaume and Péronne to outflank the Somme defences and constrain the enemy to a more accentuated retreat; and the First Brit. Army (Gen. Horne) was to attack still further N. Between Aug. 18

and Sept. 20 these three attacks were all in full motion. As to the first, by Aug. 26 the Tenth Fr. Army had reached the Oise and Ailette Rs.; the Brit. Armies had broken the Ger. front between Croisilles and the Somme; and the Eighteenth Ger. Army was falling back on the Canal du Nord. As to the second, the Tenth Fr. Army, crossing the Ailette, had reached the Hindenburg line, and the enemy was withdrawing to the Aisne. The Brit. First Army in the space of 48 hrs. had carried the Drocourt-Querant (q.r.) switch, and, by rendering the Siegfried line untenable, compelled the Ger. to retreat between Arras and the Oise towards the Hindenburg line. As to the third, which began on Sept. 18, the Third and Fourth Brit. Armies, supported by the First Fr. Army, carried the outposts of the Hindenburg line, between Cambrai and St. Quentin, and gained their point of departure for the next attack on that celebrated line of defence. Finally, while these last phases of the battle of Picardy were in progress, the Amer. Army in the Meuse had brilliantly executed its first big attack, reducing the entire St. Mihiel salient between Sept. 12 and 15 (see also ARGONNE).

General Offensive of the Allies.—The Battles of Champagne, Cambrésis, and Flanders (Sept. 26 to Nov. 10).—Marshal Foch, from the end of Aug., concluded that the time was approaching when the disorganisation and fatigue of the Ger. Armies were such that a general attack would bring about their final defeat. He therefore planned three great converging attacks, to be begun simultaneously or at all events at intervals of a few days only. These were (1) *In Flanders*, where the attenuation of the Ger. line from the Lys to the sea, their fatigue and lack of reserves, were offering a favourable situation for exploitation by the Allies. This operation, begun by the Belgian Army supported by Fr. and Brit. divs., had for its first tactical objective the capture of a *point d'appui* or starting point, by carrying the front Clerken forest-Houthulst ridge-Passchendaele-Gheluveld-Comines; and, for its second objective, to follow this up at once by an attack on Bruges to free the coast, and, by another attack eastward in the direction of Thielet and Ghent. (2) A central operation in which the Brit. Armies and the left of the Fr. Army should attack in the direction of St. Quentin and Cambrai, in order to force the Hindenburg line before the enemy should have time to organise, while simultaneously the Fr. centre should carry on energetic operations to drive the enemy beyond the Aisne; and (3) an operation in the Argonne in the direction of Mézières, in which all the available Amer. troops should attack between the Meuse and the Argonne, supported on the W. by the Fourth Fr. Army, which latter should attack between the Argonne and the Souain road.

The various attacks comprised in this general plan were to set afame at least two-thirds of the Ger. line on the entire front from the sea to the Meuse, and they

were to begin about Sept. 23. In fact the battle of Champagne began on Sept. 26, and after a struggle lasting a week the enemy was compelled to fall back on the Aisne and the Aire, which latter positions were reached by the Allies on Oct. 12. The battle of Cambrai began on Sept. 27; the First and Third Brit. Armies attacked in the Cambrai region; and on Sept. 30 the battle had extended as far as the Oise by reason of the coming into line of the Fourth Brit. and First Fr. Armies. By Oct. 9 the Second and Eighteenth Ger. Armies had lost the Hindenburg line—a line which their leaders deemed impregnable—and were forced to fall back on the whole front between Douai and St. Quentin, and take up new positions behind the Selle R. and on the Bohain-Bernot line. While these two armies were falling back the Seventh Ger. Army further S. was evacuating the massif St. Gobain-Laon, which, as a result of the allied advance in Champagne and Cambrai, now formed a vast salient, and was retreating to the Serre and taking up positions beyond the Sissonne marshes. (These positions were known as the Hindenburg line.) This movement was followed by a fresh retreat by the Second and Seventeenth Armies, which, hard pressed by Franco-Brit. attacks on Oct. 13 and 19, were retreating across the Oise and the Sambre Canal. The battle of Flanders, begun on Sept. 28, gave the Allies the hills to the E. of Ypres and threw open in two days the Roulers-Menin road. After a short interval it was resumed on Oct. 14 and from the 17th the enemy was compelled in the N. to evacuate the whole Belgian coast and fall back on the Terneuzen Canal, and, in the S., to evacuate the regions of Lille and Lens and to retreat to positions beyond the Scheldt and the Canal du Nord.

In short, between Oct. 10 and 20, the enemy's retreat had become general on the whole front. Foch, with the full knowledge that the wastage and exhaustion of the enemy were such that he could not for any appreciable period of time resist an attack of any importance, gave orders for a prompt renewal of the general offensive from the sea to the Meuse so as to dislodge the enemy from his last defensive organisations (viz., the Hindenburg and Hermann defences and those of the Lys). On this line Foch calculated that the final battle would be fought. Accordingly simultaneous and converging attacks by the Allies—namely, by the Belgians and Brit. in the direction of Brussels, by the Brit. between the Sambre and Scheldt, by the Fr. Armies in the direction of Tivoli, and by the Franco-Amer. Armies in the direction of Mézières and Sedan, begun early in Nov.—forced the enemy line into a general retreat between the Scheldt and Meuse. On Nov. 9 this retreat had stretched northward, and the enemy was abandoning the course of the Scheldt between Oudenarde and Tournai. So that on Nov. 11, the day of the Armistice, all the Ger. Armies between the sea and the Meuse were in full retreat.

The British Victories.—The principal battles fought by the Brit. Armies in the

course of these operations achieved the results indicated:

Battle of Amiens (q.v.) (Aug. 8-12).—From Amiens and the Paris-Amiens railway. The attack was then transferred to the N. in the *battle of Bapaume* (Aug. 21-31), which, outflanking the Ger. position on the Somme, obliged the enemy to withdraw to the E. bank of the riv. The new Ger. positions were then turned from the N. by the *battle of Arras* (q.v.) (Aug. 26-Sept. 3) by which the Drocourt-Quentain (q.v.) line was broken and the enemy forced back on the outer defences of the Hindenburg line. As the direct result of these three battles the Lys salient was evacuated by the enemy, and Lens, Merville, Baillieul, and Kemmel hill were regained, and Hazebrouck and the railways in that vicinity were freed. At the *battle of Episy* (Sept. 18-19) the Brit. broke through the outer Hindenburg defences and took up positions for attack on the main line in the *battle of Cambrai-St. Quentin* (Sept. 27-Oct. 10), the biggest Brit. victory of all. At the close of some ten days of victorious fighting the attacking troops broke through the last and strongest of the enemy's fully prepared positions—positions manned by the very best of his troops. This now opened the way at last to a war of movement and an advance on the Ger. main lines of communication. The Ger. prisoners taken in this battle were more numerous than in any other engagement in the war. This was really the psychological moment of the great campaign of 1918 in the truest sense, for the Ger. morale never recovered from the blow. The resistance of the Ger. troops most perceptibly fell away, and Ludendorff was warning his gov. of the probable results. The victorious Brit. now stormed the Canal du Nord and advanced on Cambrai, turned the formidable defences of St. Quentin, and developed all these successes by delivering a general attack on the last of the solidly organised defences in rear of the Hindenburg line. In this, the *second battle of Cambrai*, that tn. and St. Quentin were evacuated by the enemy, who then took up fresh positions on the Selle R., the Brit. having in the battle retaken the double railway line from St. Quentin to Cambrai and the important railway junction of Douai. These great victories had their repercussion elsewhere, for Ludendorff (*Iter. White Paper*, July 1919) feared that the attack would extend to the front in Alsace, and it seems that the lessening severity of the fighting from this point in the remaining allied victories and the steady withdrawal of the enemy's forces after actions of comparatively brief duration were due to the difficulty of the Ger. high command in the matter of reinforcing their line in Alsace.

Even before the close of the first battle of Cambrai the Brit. Second Army, together with the Belgian Army, were forcing the enemy back from Ypres, and driving a salient into his lines which threatened his coastal positions (Sept. 28-29). This success had its sequel in the *battle of Courtrai* (Oct. 14-31), which

forced the Gers. to abandon the Belgian coast, and with it their submarine base of Zeebrugge. With Courtrai, Menin and Halluin also fell, and the stretch of road between Ypres and Menin—that veritable mausoleum of Brit. dead in the previous four years of fighting—had now for ever ceased to haunt the life of the Brit. soldier and the waiting people at home. The great salients formed to the N. by the second battle of Cambrai and to the N. by the battles of Ypres and Courtrai led indirectly to the evacuation of Laon and the loss of the famous massif of St. Gobain (captured by the Fr. Armies). The penultimate of the great Brit. victories was at the battle of the Selle (Oct. 17-25), and this was speedily followed by the battle of Maubeuge (Nov. 1-11), in which the triumphant armies of Gens. Horne, Byng, and Rawlinson broke the last important lateral communications, turned the Scheldt positions, and sent the enemy in rapid retreat from the vicinity of Courtrai. The strategical aim of the great series of battles was now accomplished, for the enemy's line was now split into two parts, one on each side of the great natural barrier of the Ardennes. The pursuit of the beaten enemy all along the line was only stopped by the armistice.

See Sir John French (earl of Ypres), 1914, 1919; J. Buchan, *A History of the Great War*, 1921-22; W. Churchill, *The World Crisis*, 1923-29; G. V. Carey and H. S. Scott, *An Outline History of the Great War*, 1928; F. Foch, *Memoirs* (trans. by T. B. Mott), 1931; J. J. Pershing, *My Experiences in the World War*, 1931; P. von Hindenburg, *Out of my Life* (trans. by F. H. Holt), 1933; H. Bidou, *Histoire de la grande guerre*, 1936; L. Hart, *The War in Outline*, 1914-18, 1936; Dufour, Joffre et la guerre de mouvement, 1914-1937; E. O. Volkmann, *Strategie des Weltkriegs*, 1937; also (novels), II. Barbusse, *Feu* (trans. by Fitzwater Wray, *Under Fire*, Everyman's Library, 1926), E. M. Remarque, *In Western Nights* (trans. by A. W. Wheen, *All Quiet on the Western Front*, 1933), 1929; (drama), R. C. Sheriff, *Journey's End*, 1929.

France and Germany Star was instituted for operational service on land from June 6, 1944, in France, Belgium, Holland, or Germany, until May 8, 1945. The ribbon is in the red, white, and blue of the Union flag, and these colours are also used as a symbol of France and the Netherlands. The 1939-45 star must be earned by six, or for air crew two, months' service in operations before a candidate can qualify for the F. and G. S. The star is not awarded in addition to the Atlantic Star (q.v.) or the Air Crew Europe Star (q.v.). If a candidate qualifies for all three stars or two of them the star first earned is awarded.

France, Il d^e, see MAURITIUS.

Francesca da Rimini, daughter of Guido da Polenta, lord of Ravenna. She was given in marriage about the year 1275 to Giovanni the Lamp (Gianciotto or Sciancato), son of Malatata, lord of Rimini,

when peace was concluded between the houses of Ravenna and Rimini. The elder brother of Giovanni, Paolo the Handsome, was sent to Ravenna to fetch Francesca, and the two fell in love with each other. Giovanni found them together (c. 1285), and killed them both. The story, which has many modifications, is treated in Dante's *Inferno*, and also in literature by Leigh Hunt, Silvio Pellico, Stephen Phillips, and Gabriele Annunzio; and in art by Ingres, Ary Scheffer, G. F. Watts, and Cabanel.

Francesca, Piero della, see PIERO.

Francesco dei Rossi, see SALVIATI.

Francesco di Paula, or St. Francis of Paula (c. 1416-c. 1507), founder of the order of Minimites, b. in Calabria, and at an early age entered a Franciscan monastery, and later became a hermit. He was joined by sev. others, and 1436 erected a chapel. In 1474 the community, with Francis as its superior, was confirmed by Pope Sixtus IV. as the Hermits of St. Francis of Assisi, the name being changed to the Minim Hermits of St. Francis of Paula by Alexander VI. He attended at the death-bed of Louis XI. of France, and Charles VIII. built him convents at Plessis and Ambroise. See life by C. Roberti, 1915.

Franche-Comté, old prov. of E. France in Rhone basin. It corresponded to the co. of Burgundy and comprised what now forms the dept^s. of Doubs, Haute-Saône, Jura, and a portion of Ain. Its cap. was Dôle. A rich land, varying in character from the rich, grain-producing valleys of the Doubs and Saône, through vine-clad terraces, to the thickly wooded heights of the Jura Mts., its possession has been much disputed. Early in its hist. it formed a part of the kingdom of Burgundy; under the Carolingians it belonged to that of Arles; it then passed from hand to hand, being for a short period a possession of the Fr. king, and at length, on the marriage of Mary of Burgundy to Maximilian, became a part of the empire. Charles V. gave it to the Sp. branch of his family, but it ultimately became Fr. ter. under the treaty of Nijmegen. After the revolution the old prov. was broken up. The inhab. of the F.-C. earned a reputation for themselves as hardy and independent people. Colonies of emigrants from the prov. were to be found in Rome, Milan, Madrid, and other European cities.

Franchet D'Esperey, Louis Félix Marie François (1856-1912), Fr. general who gained a reputation during the First World War. After the battle of Charleroi (Aug. 1914) he was appointed to the command of the Fr. Fifth Army. In Sept. 1914, in co-operation with Foch, he brought to a standstill the Ger. counter-attack from the valley of the Suptze. In June 1918 he was appointed commander-in-chief of the allied forces in Macedonia, and he at once infused his characteristic vigour into the operations on that front, which hitherto had been regarded as stagnant. He organised an offensive against the Bulgarians and in the autumn attacked and broke up their army as a fighting instrument. This success, which

threatened Constantinople and hastened Turkey to conclude an armistice, undoubtedly influenced the general collapse of the central powers.

Franchise: 1. As used synonymously with liberty, F. means a royal privilege conferring exemption from ordinary jurisdiction, e.g. the chancery court, of the Co. Palatine of Lancaster, or any other prerogative right granted by the king, such as the right to a manor or lordship, to hold a fair, to have a forest, warren, or fishery, treasure-trove, waifs, and estrays. Such Fs. often arise by prescription assumed to have been founded on some original and lost royal grant. All such Fs. belong to the class of Incorporee hereditamenta (q.v.). 2. The right of voting for a member of Parliament or councillor of some municipal body. (For the qualifications of co. and bor. electors see ELECTORATE, ELECTIONS.) Generally speaking an action for damages lies for every wilful interference with the exercise of a F., and it is immaterial whether the defendant acted in good faith or under a mistaken notion of duty or not. The historic case of *Ashby v. White* decided that an elector was entitled to sue a returning officer for refusing his vote.

Francia, or Francesco Raibolini (c. 1450-1517). It inter. b. at Bologna; originally a goldsmith and engraver of dies for medals, and became mint-master at Bologna, not taking up painting till middle age, when he made the acquaintance of Mantegna. He was much influenced by Perugino and Raphael. Among his works are 'Virgin enthroned, with Augustine and five other saints' (Bologna Gallery); 'Virgin and Child and St. Anna,' and 'Pieta' (National Gallery, London); 'Virgin' (Munich); 'St. Peter, Martyr' (Borghese Gallery, Rome), and the frescoes in the church of St. Cecilia, Bologna. See G. C. Williamson, *Francia*, 1901; A. Venturi, *La pittura del cinquecento*, 1925.

Francia, José Gaspar Rodríguez da (1757-1850), dictator of Paraguay, b. at Asuncion, of Portuguese origin, his father, García Rodríguez Francia, being a native of Brazil who came to Paraguay to manage a tobacco plantation for the gov. He studied theology at the univ. of Córdoba de Tucumán, and took his doctor's degree, but later turned to the law, and for thirty years was an able and successful jurist and public official. In 1810 the revolution against Spain broke out at Buenos Aires, and though Paraguay at first opposed the movement, it declared its independence in 1811, and F., who had been a leading revolutionary, was made secretary of the national junta. In 1813 he was made joint consul with the Gaucho general, Fulgecio; in 1814 he secured his own election as dictator for three years, and at the expiration of that period obtained the dictatorship for life. He was far from being a mere figure-head and, like Louis XIV., might well have said 'L'état c'est moi.' The accounts of his administration show him to have been a remarkable blend of ability and caprice, of far-sighted wisdom and reckless infatuation and,

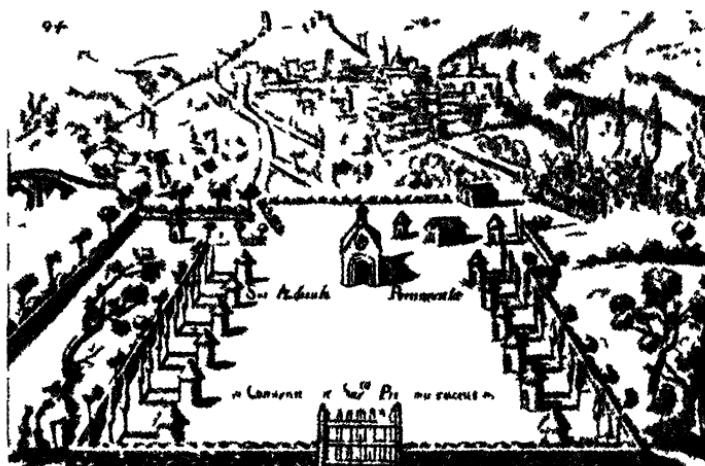
withal, a man who, while seeming to aspire to the highest ideals, would yet violate the most elementary principles of justice. His life was one of extreme simplicity, yet he punished with Draconian severity the slightest want of respect. His economic policy was to sacrifice foreign commerce and encourage domestic industries. In eccles. policy he was a bitter adversary of the Church, and abolished both the Inquisition and the College of Theology. Much that was apparently arbitrary in his actions was, however, due to his being strongly influenced by the principles of the Fr. Revolution, and despite all his real or apparent contradictions of character and arbitrary conduct his death was much regretted by his countrymen, who forgot his extravagance and remembered only his merits. See T. Carlyle, *Critical and Miscellaneous Essays*, vol. iv., 1840; R. F. Burton, *Letters from the Battlefields of Paraguay*, 1870; and C. A. Washburn, *History of Paraguay*, 1871.

Francis, of Assisi, St. (1182-1226), Rom. Catholic saint, founder of the Franciscan order. He was b. at Assisi in the upper middle class, his father, Pietro Bernardone, being a prosperous merchant of that city. As a youth he was a prominent leader of nightly revels, and fought with great spirit in a petty feud between the towns of Assisi and Perugia. Assisi was defeated, and F. was taken prisoner in 1201, and remained a captive till the following year. The rest enforced by a serious illness in his twenty-second year made him dwell upon his mode of life. On his recovery he attempted to take up arms once more, but was struck down by a second illness at Spoleto. For a time he threw himself half-heartedly into the pleasures of his fellows, though the spiritual conflict was still waging within him. He determined to cast off his old life and to obey implicitly the commands of the N.T. He adopted the attire of a poor mendicant, took a vow of poverty, and devoted himself to prayer and to helping the poor. He went on a long pilgrimage to Rome, and on his return to his native place he worked among the lepers at Gubbio, and gave alms profusely. In spite of the angry remonstrations of his relatives, he continued to walk the streets dressed in the meanest garb, and was frequently pelted with mud by his former companions. At last, in 1206, his father disbarred him publicly, and F., having already united himself to 'holy poverty,' his bride, now renounced his earthly relatives and declared that 'henceforth he had but one Father, Him that is in heaven.'

While praying one day in the ruined chapel of Sta. Maria dell' Angels, known as the Portiuncula, or 'little inheritance,' he was visited by a vision, which directed him to his vocation. Clad only in a rough woollen garment, girt with a hempen cord, he went out and preached to the poor of Assisi, the tugh only a layman. By 1209 he had gathered round him eleven disciples, the first two being Bernard Quintavalle and Peter Cattano. In the following

year the band of twelve went to Rome where they obtained the sanction of Innocent III to their preaching and their mode of life his authorisation being formally granted in 1216. On his return to Assisi in 1212 he drew up the constitution of the order. He laid greatest stress on poverty the other vows of the order being chastity and obedience. Great numbers of disciples flocked around him. He organised his men and sent them out in bands as missionaries to France, Italy, Spain, and Africa. In 1223 he himself went out to Egypt and obtained from the sultan promises of better treatment of Christian prisoners and the guardianship

Flowers and the *Life of St Francis*) According to Sabatier the *Speculum* was the first of all the lives and was written in 1227 by Brother Leo of Assisi F's favourite disciple while the *Legenda* & *Soc* (the legend of his three companions) was a forgery. Thomas of Celano's lives, in Sabatier's opinion, were written in opposition to the *Speculum*. W Goetz, in a critical review of the whole ground, *Die Quellen zur Geschichte des hl. Franziskus von Assisi* (1901), refutes Sabatier's assertions and comes to the conclusion that the *Speculum* is a fourteenth century compilation and largely a forgery. The official life of F is St Bonaventura's



THE PORTUNCULA ASSISI ABOUT THE TIME OF ST FRANCIS

This illustration is from a print in the *Coll. S. Radici* (1704). The long stilt at the right of the church was the infirmary where St Francis died and the one on the left was his cell. The other mud huts and the wall were added after St Francis's death.

for his order of the church of the Holy Sepulchre. He had to contend with opposition from Rome where new regulations had been forced upon his order and the vow of poverty which to him was so essential had been fixed. On Sept 14 1224, according to the legend told by his biographers, he received the stigmata of the very wounds of Jesus Christ upon his own person while lying on Monte Alverno near Assisi. Two years later on Oct 4 feeling that death was drawing near, he was carried to the Portuncula and died on the bare ground. Pope Gregory IX canonised him in 1228. The chief sources for the life of F and for the beginnings of the Franciscan order are two lives by Thomas of Celano (1228 and 1248, Eng trans by A G Ferrer Howell 1908), and the *Speculum perfectionis* (Mirror of Perfection), discovered by P Sabatier (ed in 1898, Eng trans by De la Warr, 1904, and in the Everyman's Library, in which issue are also included *The Little*

Legenda, pub by the Franciscans of Quaracchi 1898 (Eng trans in Everyman's Library, 1910).

The works of F including hymns, proverbs, sermons, and letters, were printed in folio in 1733. An ed in Lat with an It trans was pub by B da Livizzano (Florence 1890). See A Butler, *The Lives of the Saints* 1756-59; Brother Leo of Assisi, *Saint Francis of Assisi* (trans by S Evans) 1899; A. François d'Assise et la légende de ses trois compagnons, 1901; J Herklots, *Francis and Dominic* 1901; P Sabatier, *Acta Beati Francisci et Sociorum eius*, 1902; G K Chesterton, *St Francis of Assisi*, 1926; W Seton (editor) *St Francis of Assisi: Essays in Commemoration*, 1926; 1927, 1928; *The Little Flowers and the Life of St Francis* 1928, H Goad, *Grey Friars*, 1948; also lives by C Iliffe, 1856; Margaret Oliphant, 1871; St Bonaventura, 1888; P Sabatier, 1893, and P Henry, 1903.

Francis Borgia, St., see BORGIA, FRANCESCO.

Francis of Paola, St., see FRANCESCO DI PAOLA.

Francis of Sales, St. (1567–1622), Rom. Catholic saint and devotional writer, b. of noble family at the castle of Sales, near Annecy, Savoy. After studying at the colleges of La Roche and Annecy, he entered the school of Jesuits in Paris (1578) and subsequently studied civil law in Padua (1584–91). Soon after taking orders he went on a missionary expedition to the Calvinists of Chablais, and met with great success. Sev. attempts to murder him were frustrated. He was appointed to the bishopric of Genova in 1602. He founded a congregation of nuns of the order of the Visitation, of which his friend Madame de Chantal became first superior. His chief work, *Introduction à la vie dévote*, pub. 1609, has been trans. into most European languages. He also wrote a *Traité de l'amour de Dieu, and Entretiens spirituels* (publ. posthumously). See the ed. of J. P. Migne, 1861; Mrs. Lear, *Christian Biographies*, 1877; also lives by C. A. do Sales, 1633; A. J. Hamon, 1856; H. Bordeaux, 1924; F. Strowski, 1928; J. Leclerc, 1928; and F. Ehrenborg, 1937.

Francis I. (1704–65), head of the Holy Rom. Empir., the 4th son of Leopold, duke of Lorraine, b. at Nancy. He succeeded to the dukedom in 1729, but in 1735, at the end of the Polish war of Succession, he received Tuscany in exchange for Lorraine. In 1736 he married Maria Theresa, who succeeded her father, Charles VI., to the dominions of Austria in 1740.

Francis II. (1768–1806), head of the Holy Rom. Empire, and as Francis I. emperor of Austria (1806–35), the son of Leopold II., b. at Florence in 1764. Succeeded 1792. By the peace of Campo Formio (1797) he exchanged the Netherlands and Lombardy for Venetia and Dalmatia. In 1804 he assumed the title of emperor of Austria, which was confirmed by the Confederation of the Rhine in 1806, when he abandoned the title of Holy Rom. Emperor. By the treaty of Vienna (1809), Austria lost further ter. to France, but was victorious at the battle of Leipzig (1813), and by the treaty of Vienna (1815) her position in Europe was firmly estab. See Baron J. A. Illefeld, *Kaiser Franz*, 1867; and H. Meynert, *Franz I.*, 1871–73.

Francis I. (1494–1547), king of France, the successor of his uncle and father-in-law, Louis XII., and the son of Charles, comte d'Angoulême, b. at Cognac. He married Claude, daughter of Louis XII., in 1514, and succeeded him on the throne Jan. 1, 1515. Immediately after his accession he recaptured Milan, and in 1516 signed a concordat with the pope by which the Fr. Crown acquired extensive church privileges lost only at the Fr. Revolution. On the death of Maximilian (1519), F. was a rival claimant with Charles of Spain to the imperial crown, and after the election of the latter, F. prepared for Henry VIII. the 'Field of the Cloth of Gold' (1520), but was unsuccessful in securing an

alliance with England. The Holy See, Venice, and the powers united to drive France out of Italy, and in 1525 F. was defeated at Pavia and taken captive to Madrid. War continued till 1529, when, by the treaty of Cambrai, F. lost his It. possessions, but retained Burgundy. Hostilities were renewed against Charles V. (1534), the war concluding with the peace of Crespy (1544). In social and intellectual results his reign was fruitful; for, if he condoned by his example licentiousness of manners, he gave a great impulse to refinement in taste and to intellectual



FRANCIS I. OF FRANCE

enlightenment by encouraging in France the lessons of the It Renaissance. He was a patron of art and literature, and in 1530 founded the Collège de France; and, by the acquisition of masterpieces of It. painting and sculpturo and in the superb structure of Fontainebleau, Chambord, and Amboise bequeathed a permanent influence on Fr. art. See G. Paris, *François I.*, 1888; and Julia Pardoe, *The Court and Reign of Francis I.* (new ed.), 1887.

Francis II. (1544–60), king of France, eldest son of Henry II. and Catherine de' Medici, b. at Fontainebleau. He married Mary Stuart, queen of Scotland (1558), whose uncles, the duke of Guise and cardinal of Lorraine, virtually ruled during F.'s brief reign. Ascended the throne in 1559.

Francis, John (1811–82), Eng. pub., b. in London. He entered the office of the *Advertiser* as a clerk in 1831, and in two months became its business manager and publisher, which position he retained till his death. He was also business manager of *Notes and Queries* from 1872 to 1882. The 'John Francis Pensions' of the News-vendors' Benevolent Institute were founded to his memory. See life by O. J. Francis, 1888.

Francis, Sir Philip (1740–1818), politician, after being for some years in the civil service, he went in 1774 to India as a member of the council of the governor-general. There he was a bitter opponent of Warren Hastings, with whom in 1779

he fought a duel and was wounded. He returned to England in the following year with a considerable fortune, and entered Parliament. He still took an active interest in Indian affairs, and in 1787 assisted Burke and the managers of the impeachment of Hastings to prepare their charges. He is best known as the reputed author of the *Letters of Junius*, and he is to-day generally regarded as the writer of those papers, but there has never been produced any definite evidence as to the truth of the assumption. See JUNIUS, LETTERS OF.

Franciscans, or Friars Minor (Lesser Brethren), are a religious order of the Rom. Cathol. Church founded in 1208 by St. Francis of Assisi. The order was founded, like all the early orders, on the threefold vow of chastity, poverty, and obedience. St. Francis laid special stress upon the vow of poverty, so that it was not only forbidden to individuals to possess riches, but also it was unlawful for the community to possess property. The vow of poverty was extremely stringent; the members of the order did not even possess the clothes they wore. The order grew rapidly, but the poverty enjoined occasioned much dissension. During the life of St. Francis his authority was sufficient to prevent any modifications of his rule, even after he had abdicated from the post of minister-general of the order. After his death his successor, Brother Elias, attempted to institute changes, but a reaction set in towards St. Francis's ideals. Many years of dispute followed, and the order was split into three parties. Under Pope Leo X. two separate divs. were made in the order; the Conventualists, who by a papal dispensation were released from the extreme poverty of the order as inaugurated, and the Observants, who were strict followers of St. Francis. In 1523 Brother Matteo formed a new div. called Capuchin, because of the peculiar peaked hood which they wore. The Capuchins claim to be the closest followers of St. Francis. The F. are under a democratic form of gov. The final authority is vested in the minister-general, who resides in Rome. Under him are the provincials, each presiding over all the brethren in a prov. The head of each monastery is called the 'custos,' or guardian.

The Conventuals, Observants, and Capuchins constitute the First Order. The Second Order consists of nun, the nuns of St. Clare or Poor Clares, the Capuchinesses, the Urbanist nuns, etc. The Third Order or Tertiaries consists of members who live in society, not taking the vow of celibacy, but are bound by the spirit of the rule of the order. More recently certain active congregations of men and women have adapted the principles of the Tertiaries to a conventional regime and are known as the Conventional Third Order. The F. have been foremost in foreign missionary work, and throughout all their internal dissensions they have faithfully continued St. Francis's work of ministering to the poor. There are many notable names in the order. Most of the great Eng. theologians were F., as for

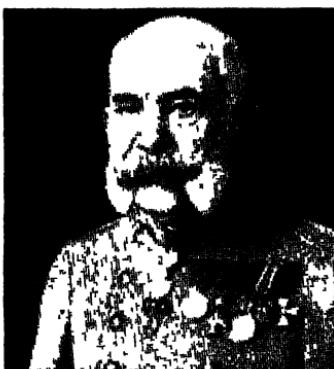
example St. Bonaventura, Alexander of Hales, Duns Scotus, Wm. of Ockham. In the world of letters Roger Bacon was a prominent member of the order. Of the popes, Nicholas IV., Alexander V., Sixtus IV., Sixtus V., and Clement XIV. were F. The F. reached England in 1220. At the Reformation there were sixty-five monasteries in England. After the dissolution of the monasteries the order was restored by the foundation of an Eng. convent in Douay in 1617. There are now twelve houses in Great Britain, and seventeen in Ireland; statistics pub. in 1911 gave the number of 24,844 members in 2093 monasteries, in thirty countries of the world. See L. Wadding, *Annuales Fratrum Minorum*, 1650; P. Gratiot, *Histoire de la fondation et évolution de l'ordre des Frères Mineurs du XVII^e siècle*, 1928; A. Masseron, *The Franciscans* (trans.), 1931; V. D. Scudder, *Franciscan Adventure*, 1931; P. Cowley, *Franciscan Rise and Fall*, 1933.

Francis Ferdinand of Austria, Archduke (1863-1914), nephew of the former emperor of Austria, the son of Archduke Charles Louis, b. at Graz. After the suicide of Prince Rudolf (1889), he became heir apparent, but in 1900 the archduke made a morganatic marriage with Countess Sophia Chotek, created Princess von Hohenberg, and renounced the right of his future children to the thrones of Austria and Hungary. His assassination at Sarajevo on June 28, 1914, was the immediate cause of the rupture between Austria-Hungary and Serbia, which brought on the First World War. Very various opinions of his powers as an administrator are held. His education, like that of the sons of Archduke Otto and of the princes of the House of Hapsburg-Lorraine, generally was not of a kind to fit him for the task of government. But F. F. is credited with a quick grasp of essentials and a good memory, which helped to supply the defects of education. In his administration in Bosnia he showed at times extreme obstinacy, and at other times that he could be easily influenced. It is probable that he was fully alive to the importance of settling the S. Slav question and in a way which should commend itself both to Austria and to Hungary, for he would have gone as far as to postpone his own coronation as emperor of the dual monarchy until the two halves of the empire were in accord on this great question. High hopes had been entertained both in Austria-Hungary and in Germany in him. The Catholics favoured him for his piety, the Gov. people for his loyalty to the Ger. alliance, and his own people because his obvious patriotism and vigorous if unimaginative fulfilment of his administrative duties promised well after the aged Francis Joseph should pass away. But there is no doubt that he was intensely disliked by the Serbs and Bosnians. This is easily explained by the belief that he was the protagonist in a project to unite the Bosnian Serbs and Croatia-Slavonia with Austria and Hungary into a triple monarchy, a project which involved Austro-Hungarian opposi-

tion to any further territorial expansion of the two independent Serbian kingdoms lest such complications should thereby be introduced as would render the project impracticable. For this reason all patriotic Serbs and Montenegrins from 1908 to 1914 organised secret societies in the S. Slav countries and disseminated propaganda to further the object of severing all the S. Slav peoples from the Hapsburg empire. It is therefore not surprising that, the official Austrian investigation into the murder of F. F. and of his wife by youthful Serbian conspirators having established that the outrage was at the instigation of secret revolutionary societies and with the connivance of Serbian Gov. officials, intense indignation was aroused among both Ger. and Magyar elements in Austria-Hungary, who saw in the murder, and not without reason, a shattering blow at the very existence of the dual monarchy. Equally, however, the welfare of the Serbs appeared in those days to be bound up with that of Russia; wherefore the murder of a relatively obscure archduke gave rise to a crisis which was soon destined to lead to a world conflagration. See P. Nikitsch-Bouleau, *Vor dem Sturm. Erinnerungen an Erzherzog-Thronfolger Franz Ferdinand*, 1925; monograph by V. Elsner, etc., 1929; and A. J. P. Taylor, *The Habsburg Monarchy*, 1947.

Francis Joseph (1830-1916), emperor of Austria, the eldest son of the Archduke Francis Charles, second son of the reigning Emperor Francis I., he was b. at Vienna (Aug. 18). He received instruction in the various languages of the heterogeneous Austrian monarchy and became emperor in 1848 on the abdication of his uncle, Ferdinand I. At this time Hungary was in a state of open revolt, and declared itself a republic in the course of the following year, with Kossuth as governor. However, aided by von Bruck, Francis inaugurated a series of fiscal and commercial reforms favourable to the interests of the middle classes. In 1853 the emperor tried without success to induce the Tsar Nicholas to abandon his designs against Turkey, and in 1859 he had to face a war with France and Sardinia, ending in the loss of Lombardy. It was at the conclusion of this war that F. J. began the necessary work of reform and abandoned his conservative policy. In 1866 began the disastrous seven weeks' war with Prussia, and at the battle of Sadowa the question of the headship of Germany was decided. It was inevitable that the relations of Austria and Hungary should be rearranged and a reconstruction of the monarchy on a dualistic basis was effected by the *Ausgleich* of 1867, the Emperor F. J. being crowned at Pest. This form of monarchy existed up to the time of the First World War. In spite of numerous difficulties, and discouraging political conditions, the emperor, by his personal influence, succeeded in holding his dominions together. F. J. married Elizabeth of Bavaria in 1854, but she, refusing to be stifled by the harsh court ritual which her husband imposed, left him and after many years' wandering in

Europe, was assassinated in 1898. Their eldest son, Rudolph, dying in 1889, the Archduke Charles Francis Joseph became heir presumptive. (See CHARLES I. (KARL FRANZ JOSEPH)). With an innate stubbornness he always held on and towards the end he took the fatal step of attacking Serbia, after the murder of his nephew, Francis Ferdinand, in 1911 (see preceding article). It may be conceded that he strove in his long reign to maintain a constitutional and parl. regime in Austria-Hungary; but, though he reigned for sixty-eight years, the longest effective reign of modern times, memories of this aged emperor faded away with astonishing rapidity as events in the First World War followed one another in swift succession. Cold, impersonal and surrounded by reactionary advisers, he



THE EMPEROR FRANCIS JOSEPH

was by no means popular, and it was often prophesied before the First World War that, on his death, the last hour would also sound for his empire. His last illness overtook him in the palace of Schönbrunn near Vienna at the beginning of Nov. 1916, as the Austro-Hungarian and Ger. armies, fresh from victory at Cronstadt and Hermannstadt, were overrunning Rumania. Yet even when it was clear that his days were numbered, his sense of duty compelled him to perform his daily work as though he were in his customary good health. He lingered thus for some ten or eleven days, and even when it seemed he could scarcely outlive the day, the dawn of Nov. 21 found him seated once more before his writing table. But by evening of the same day he was dead. In the expectation of a crisis the Archduke Charles had been recalled from the Rumanian front, but no crisis occurred, and Charles, grand-nephew of F. J., was crowned with every mark of popular acquiescence. The collapse of the empire, however, was a reality less than two years later. See H. de Weindel, *The Real Francis Joseph*, 1909; E. Gialise-Horstenau, *Collapse of Austria-Hungary*,

1930; and A. J. P. Taylor, *The Habsburg Monarchy*, 1941, 1947.

Francis Xavier, see XAVIER.

Franck, César Auguste (1822-90), Belgian composer and organist, b. at Lillego, on his father's side, of a family which had lived for generations at Genmenich; his mother was a Ger., and came from Aix-la-Chapelle. He became a naturalised Frenchman in 1873. After an academic career of unusual brilliance, he began an arduous life of composition and teaching, a life which, although uneventful, was destined to bear great fruit. He was organist at Notre-Dame de Lorotte, then at Saint-Jean-Saint-François, and finally



E.N.A.

CÉSAR FRANCK

at Sainte-Croix—where he had been choirmaster since 1858. This rendered his financial position more secure, besides enabling him to establish his reputation as a soloist. His improvisations on the organ left an impression of something unique and profoundly moving. F. gathered together a circle of young, eager students, including such names as d'Indy, Chausson, Lekeu, Bordet, and Duparc, and with them pursued the study of polyphonic and symphonic music; he may, indeed, be called the father of modern Fr. music. His compositions abound in rich and beautiful harmonic innovations, and (except for some early insincere works which are fortunately forgotten) are imbued with a spirit of deep reverence and mysticism, particularly the oratorio *Les Béatitudes* (1870), and the D minor symphony (1889). His orchestration and treatment are masterly; and the concerted works for piano and orchestra are full of poetry and romantic charm. In chamber music, besides the famous piano quintet (1880), and the string quartet in D (1889),

he has left the superb violin and piano sonata in A (1886). His own domain is lyricism, pure and simple, the outward projection of his inmost dreams, and in this he is almost without equal. Pianists and organists are also indebted to him for sev. fine solo compositions. Yet during his lifetime he was very little appreciated except by a select public. Later, opinion changed so completely that he is now venerated as one of those inspired master-minds who have inaugurated fresh eras in the hist. of music. Other works include *Les Éolides* (1876); *Psyché* (1887-88); *Ghislée* (1888-90), lyrical drama; *Hulda* (1882-85), opera. See E. Destranges, *L'Œuvre lyrique de César Franck*, 1897; and lives by V. d'Indy, 1906, 1930; M. Emmanuel, 1928; G. Tournemire, 1921; and N. Demuth, 1949.

Franck, or Frank, Sebastian (1499-1542), Ger. writer, b. at Donauwörth. He took priest's orders and held a curé in 1524 near Augsburg, but soon after became a follower of Luther. In 1528 he pub. *A Treatise against the Horrible Vice of Drunkenness*. This work was very popular. He soon, however, drifted away from the school of Luther, and was banished from Strasburg in 1531 because he advocated religious toleration in his *Chronica*. In 1532 he settled at Ulm as a printer, and was banished from this city on the pub. of his *Paradoxa* in 1534. He also wrote *Welbucht* (1534), a supplement to his *Chronica*. See A. Reimann, *Sebastian Franck als Geschichtsphilosoph*, 1922; and a monograph by W. E. Pouckert, 1943.

Francken (sometimes Franck). Flemish family of painters, in four generations, beginning with Nicolaes (? 1520-96). His three sons who painted were *Hieronymus I.* (1510-1610), *Frans I.* (1542-1616), and *Ambrosius I.* (1544-1618). The next generation was three sons of Frans I., viz. *Hieronymus II.* (1578-1629), *Frans II.* (1581-1612), and *Ambrosius II.* (d. 1632). The generation after that supplied *Frans III.* (1607-67) and *Hieronymus III.* (b. 1611), sons of Frans II. The list is completed by *Constantius* (1661-1717), son of Hieronymus III. The foremost in fame is Frans I. All the family, except Constantius, painted biblical scenes chiefly—Constantius painted sieges and battles. They were all b. in or near Antwerp. Frans I. learned at the school of Frans Floris; his father Nicolaes also is said to have learned there; and the rest of the family painted very nearly in the same style. Ambrosius I. had more faults (but also a livelier merit) than his more famous brother; and the latter is, besides, considered inferior to his own son, Frans II., called Don Francesco. The other Flemish painters named Francken belong to other families—the chief being *Sebastien F.* (or *Vranex*) (1578-1647), who painted battles; and his son *Jan Baptist* (1609-1653), an exquisite painter of interiors.

Franco y Bahamonde, Francisco (b. 1893), Sp. dictator and leader of the Sp. rebel forces in the Civil war 1936-39. Spent most of his early military service in Morocco. At twenty-five he was the

youngest major in the Sp. Army. Being unpopular, he was sent to Oviedo on garrison duty instead of being given the command of his allotted battalion. He then volunteered for the *Tercio*, the foreign legion, which had just then been founded to fight beside Moors in the Moroccan war. Here he became the most successful and ruthless organiser and leader of the legionaries, who were more savage even than the Moors of the *Regulares*. Isolated by his rank and single-minded ambition from his coevals, F. now redoubled his studies in military science; war was his medium, and his one contact with life, and thus early he proved that he was as brave as he was callous. As commander of the legion, he rebelled, at Ben Tielb, against Primo de Rivera's decision to give up Morocco and the disastrous unpopular war for its conquest. This proved a successful move, for the dictator entrusted F., now a colonel (1926), with the control of operations, and the war was now fought to its end. F. now became director of the military academy. At this period the Sp. monarchy was breaking up, and in 1931 F. swore the oath of loyalty to the republic. A taciturn rebel against an anti-militarist democratic state, F. grew into a politician, imbued with the severe military logic of Clausewitz, to whom war is a continuation of politics by different means. In 1933 he was in command of the Balearic Is., and, in 1935, became chief of staff of the Sp. Army. Later he was sent by the Leroux Socialist Gov. as governor to the Canary Is., whence he flew to Morocco to organise the military uprising. In July 1936, that led to the Sp. civil war. Assumed the leadership of the rebel forces after Gen. Sanjurjo, their original head, was killed in a plane accident. On Oct. 1, 1936, he proclaimed himself 'Caudillo,' or chief of the state and commander-in-chief. At the close of some three years of bitter fighting, in the course of which he received material help in men, planes, and munitions from Italy and Germany, he crushed the Republicans, who had received some support from Russia, and became master of Spain. Joined the Anti-Comintern Pact (q.v.) in 1939. At the outbreak of the Second World War in 1939 he declared Spain's neutrality, mainly, no doubt, because his country was too exhausted to sustain further warfare, but partly owing to the conclusion of the Ger.-Russian pact of Aug. 1939. When Italy entered the war in June 1940 F., yielding to the Falangists (q.v.) declared Spain to be a non-belligerent, with Axis leanings, but, in reality, his one great fear was that Hitler, for his own ends, might send Ger. armies into Spain. Throughout 1946 F.'s regime succeeded in retaining its precarious hold on the country in spite of a strong but somewhat inarticulate opposition. This year, too, promises to restore the monarchy did not materialise. In 1946 the General Assembly of the United Nations resolved by thirty-four votes to six, with thirteen govts. abstaining, to bar F.'s gov. from all United Nations functions, to call on

member govts. to withdraw the heads of their diplomatic missions, and to instruct the Security Council to take 'adequate measures' if the regime did not end in a reasonable period. In 1947, on the eighth anniversary of his seizure of power, F. announced that Spain was to become a monarchy again, with himself as chief of state. The Bill defining the new constitution, however, made it clear that there would be no restoration of a king until the death or disability of F. This manoeuvre of F. brought an instant objection, on constitutional grounds, from Don Juan, the Pretender, while Republicans and Socialists were content to ignore it. A referendum in July asking for support of the Bill resulted in an affirmative vote of nearly 90 per cent. After an agreement, made during a meeting at sea (1948), between F. and Don Juan, the Infante Juan Carlos, nine-year-old son of Don Juan, arrived at Madrid (Nov.) to pursue his studies. The existence of an agreement between Sp. Monarchist and Socialist leaders in exile to bring about a change of regime in Spain, announced by the Brit. Foreign Office (1948), was denied by the Monarchist leader (Señor Gil Robles).

Franco-German War. The. This famous war arose out of the candidature of a Hohenzollern prince for the throne of Spain, but was mainly due to the intense jealousy that was excited in France by Germany's rise as a military power, consequent on the defeat of Denmark in 1864 and of Austria in 1866. Though the Hohenzollern candidature was withdrawn, the Fr. emperor, Napoleon III., was not satisfied, and required his ambas. Bonaparte to obtain an assurance from the king of Prussia that it would not be repeated. The interview between the Fr. ambas. and the king of Prussia was reported by Bismarck in such a way as to make it felt in France that a national insult had been received, and war was declared (July 15, 1870). Napoleon had hoped that the S. Ger. states would not support Prussia, and intended to advance into Germany in order to force them into neutrality. In spite of the assurance of the Fr. war minister that the army was ready, it was found that no adequate preparations had been made. On the contrary, the Ger. Army was in the highest state of preparation, and by the end of July more than 500,000 men had been mobilised on the Fr. frontier. The Fr. could only offer an opposition of some 250,000 men, inferior in artillery and equipment. The Ger. Army was divided into three corps, under Gen. Steinmetz, Prince Frederick Charles, and the crown prince, respectively, while the Fr. formed two armies under Bazaine near Metz, and MacMahon in the E. Vosges Mts. The first fight was at Weissenburg on Aug. 4, and the Prussians rapidly gained the battles of Worth over MacMahon and Forbach over Frossard, thereby preventing the junction of the two Fr. armies. Bazaine's army retired to Metz, where its further retreat was prevented by the battles of Rezonville, Gravelotte, and St. Privat, while MacMahon marched on Sedan, where he was defeated and

compelled to surrender, Napoleon being also taken prisoner. The Ger. armies then hurried on to Paris, which was invested on Sept. 19. In spite of the desperate efforts of the Gov. of National Defence under Trochu, Favre, and Gambetta, which succeeded the empire, disaster followed on disaster. Bazaine surrendered at Metz on Oct. 27 with 100,000 men. Gen. d'Aurelle de Paladines gained the battle of Coulmiers near Orleans over the Gers., but was subsequently defeated at Artenay, Loigny, and Patay. Gen. Chanzy succeeded in holding the Gers. in check around Le Mans, but Bourbaki's attempt to create a diversion by an invasion of Germany signally failed, and his army was forced over the Swiss frontier, where it had to lay down its arms. On Jan. 28, 1871, Paris capitulated, and peace was signed on May 10, at Frankfort-on-Main, by which France ceded Alsace-Lorraine and agreed to pay an indemnity of 5,000,000,000 francs. The last stages of the war were marked by the revolutionary outbreak of the Communists in Paris, quelled by the regular army on May 20.

Francolin, name given to birds of the genus *Francolinus*, which belong to the Perdicinae. They belong to the Ethiopian region, Arabia, Asia Minor, India, and S. China, and like the common partridge feed on insects and seeds. See PARTRIDGE.

Franconia, old duchy between Upper Saxony, the Upper and Lower Rhine, Swabia, Bavaria, and Bohemia, which has been regarded as the original home of the Franks. At the close of the fifth century it was conquered by Clovis, king of the Salian Franks, and at a later period came under the rule of Charlemagne. After the treaty of Verdun in 843 it was the centre of the Ger. kingdom, and was divided into ecos., which were ruled over by counts. Conrad, who was duke in F. about 906 was chosen Ger. king in 911. Shortly afterwards F. became immediately subject to the imperial crown, and the region itself was split up into a great number of lordships, countships, and eccles. domains, these last belonging chiefly to the bishops of Wurzburg, Worms, Speyer, Bamberg, and Mainz. These bishops were very powerful, and in 1268 the bishop of Wurzburg successfully asserted his claim to the title of duke in E. F. In 1501 Maximilian I., when dividing the empire into circles, restricted the title F. to a circle which included Wurzburg, Bamberg, Eichstätt, the abbey of Schonthal, the dist. of Mergentheim, and the principalities of Bayreuth and Anspach. The name, however, fell in abeyance after 1806, but was revived in 1837 by Louis I., king of Bavaria, who gave the names of Upper, Middle, and Lower F. to the three N. portions of his kingdom.

Frans-tireurs (free-shooters), bands of Frenchmen, mainly peasants, who took up arms against the Ger. invaders during the Franco-Ger. war. They indulged in guerrilla warfare and were not recognised by the Gers. as regular combatants, being summarily shot when captured. Towards the close of the war Gambetta organised

them, when they were treated by the Gers. as regular combatants.

Fransker, tn. in the prov. of Friesland, Holland, 5 m. from Harlingen. It was the seat of a univ. from 1585 to 1811, and possesses a tn. hall dating back to 1591. The chief industries are silk-weaving, shipbuilding, and the manuf. of woollen goods and pottery. Pop. 8000.

Frank, Hans (1900-46), Ger. jurist and administrator. A member of the Reichstag from 1930, and head of the legal dept. of the National Socialist party. Reich commissioner for justice 1933-35. Minister without portfolio, 1934. Appointed head of the civil administration in conquered Poland, 1939. His name became a by-word for sadistic cruelty there. One of the major figures tried at Nuremberg after the war. Found guilty on two counts: war crimes, such as murder and ill-treatment of prisoners of war, deportation of inhab., killing hostages, etc., and crimes against humanity, including murder, extermination, etc. (see NUREMBERG TRIAL). Executed Oct. 16, 1946.

Frank, Sebastian, see FRANCK.

Frank-almoigne, or **Free-alms**, name given to a system of tenure in A.-S. times whereby a religious corporation held land. The ordinary feudal conditions were not imposed, but those who held land in F. were bound before God to make prayers, orisons, and masses for the souls of their grantor. See TI NUR!

Frankau, Gilbert (b. 1881), Eng. novelist, son of Julia F. ('Frank Danby'), also a novelist. Among his novels are *Peter Jackson, Cigar Merchant* (1919); *Masterson* (1926); and *Michael's Wife* (1948). He has also written some verse. His daughter Pamela (b. 1908) is also a novelist.

Frankel, Benjamin (b. 1906), Eng. composer, b. in London. He was early apprenticed to the watch-making trade, but his success in winning a scholarship at the Guildhall School of Music decided his future career. He studied composition there and the violin at the Trinity College of Music. He then continued his studies abroad at Cologne and Berlin. Launched on a musical career he specialised in light music and acquired a reputation as an expert in jazz and comedy music. He wrote the scores for a number of London musical shows, his greatest success being in *Under the Counter* (1945). His earliest venture in writing music for films was in *Radio Parade of 1935* for Brit. International Pictures. His reputation in the film world grew and now rests particularly on the music written for *The Seventh Veil* (1945); *The Years Between* (1946); and *Dear Murderer* (1947). Meanwhile in the sphere of chamber music his early work *Hélène Juive* for 'cello and piano showed great promise, since fulfilled by his later works, particularly his Trio for clarinet, piano, and cello (Opus 10) and his four string quartets, the second of which was selected for performance at the festival of the International Society of Contemporary Music at Copenhagen in 1947. His compositions have a lyrical and dramatic quality which has increasingly earned the

respect and attention of music critics. His musical powers also found expression in his setting for poems by Robert Nichols, a work for voices, string orchestra, trumpet, and drums, entitled *The Aftermath* (Opus 17).

Frankenberg, tn. of Saxony, Germany, 7 m. from Chemnitz. It is noted as an industrial centre, and for extensive woollen, cotton, and silk manufs., calico printing, and dyeing works. Pop. 13,600.

Frankenhausen, tn. of Germany in Schwarzburg-Rudolstadt, situated on the Little Wipper, 27 m. N.N.W. of Weimar, and 36 m. N.N.E. of Gotha. A battle was fought here in 1525, when the peasants suffered defeat by the Saxon, Brunswick, and Hessian troops. It is noted for the manuf. of pearl buttons, cigars, and sugar; there are a salt mine and brine springs. Pop. 7100.

Frankenstein (Polish Zabkowice Śląskie), tn. of Poland, situated on a trib. of the Nisza, 45 m. S.W. of Wrocław. Before the Second World War it was an industrial centre, with manufs. of hats, woollen, cotton and linen goods, chemical and salt works. Pop. 10,100.

Frankenthal, (n. of Rhineland-Palatinate, situated on the Isenach, 8½ m. N.W. of Mannheim, and connected with the Rhine by a canal. It is known for its manufs. of machinery, printing presses, boilers, furniture, wooden ware, etc. Pop. 26,000.

Frankenwald, mountainous dist. of Germany, situated principally in the N.E. of Bavaria on the borders of the Thuringian state. It forms a link between the Thüringer Wald and the Fichtelgebirge range. In form it is an undulating plateau of about 2000 ft. elevation.

Frankfort: 1. City of Kentucky, U.S.A., and the cap. of Franklin co., and also of the state. It is situated on the Kentucky R., which is navigable for 40 m. from the city. The prin. manufs. are boots and shoes, twine, furniture, and carriages. Has a fine state capitol, state penitentiary, and a state normal school for coloured children. It is served by three railways. Pop. 11,400. 2. Also the co. tn. of Clinton, Indiana, U.S.A. It is situated at the intersection of sev. railways, 40 m. from Indianapolis. There are large machine-shops and manufac-tories of agric. implements. Pop. 13,700.

Frankfort-on-Main, tn. of Hesse-Nassau, Germany, on the Main, about 23 m. from its confluence with the Rhine at Mainz. The name means 'ford of the Franks', and it is said that this place was shown to Clovis, king of the Franks, by a deer, when he was leading an expedition against the Alemanni in 496. At any rate, the tn. is mentioned in a document as early as 793, and seems to have been of some importance, for Charlemagne, having crossed the riv. here when he was leading a campaign against the Saxons, built a hunting-seat, which was enlarged into a royal palace by Louis the Pious, who surrounded the tn. with walls in 838. After the treaty of Verdun in 843, it became the head of the N. Frankish empire, and from 1152 it was the place for

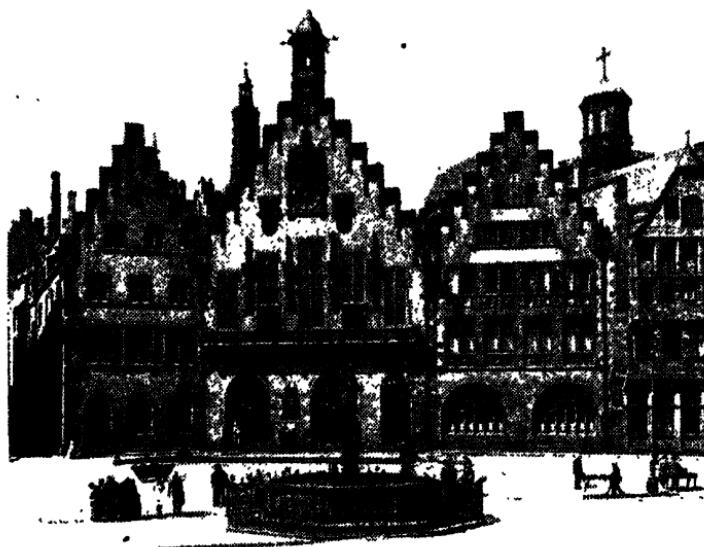
the election of the Ger. emperors. From 1815 to 1866 it was the seat of the diet of the Ger. Confederation. It is also interesting for its associations with Goethe, as well as the cathedral in which the Rom. emperors were formerly elected, founded in 852 by King Louis the Ger. Other notable buildings are the Römer, which contains the election chamber, where the Ger. kings were chosen, and the emperors' hall, where the coronation festival was held; the Saalhof, the oldest building in F.; the Thurn-und-Taxis palace, the place of meeting of the former diet; and the Haus zum Brauhaus, or exchange. It also possesses an interesting bridge, Alte Mainbrücke, made of red sandstone, which dates back to the fourteenth century. The Main having been dredged affords heavy barge traffic with tns. of the Upper Main and the Rhine. Before the Second World War it was an important inland port. The Rhine-Main-Danube Canal before the war was under reconstruction and there was a scheme for a waterway to the Weser, thus linking F. with Bremen. F. is connected by railway with all the important cities of S. and Central Germany, and is very important as a centre of trade. It was formerly the prin. seat of banking and exchange in Germany, and before 1939 only second to Berlin and still remarkable for the large business that was done in gov. stock. Publishing and printing and brewing are carried on in the suburbs of Sachsenhausen and Bockenheim, and the tn. was noted before the war as a centre for fancy goods, hats, machinery, soap and perfumery, ready-made clothing, leather goods, jewellery, and metal ware, and chemicals. Two large fairs were held in the tn., one in the spring and one in autumn. The *Frankfurter Zeitung* (q.v.) before the Nazi regime was an important Liberal organ. In 1914 the univ. was founded, also an academy of

labour.

F. was bombed during the First World War sev. times and in 1920 was occupied by the Fr. for a short period. The city was the hapless victim of numerous raids in the Second World War. The earliest devastating raid was that of Dec. 20, 1943. As a centre more especially of chemical and engineering works and a source of aircraft components, it was a frequent target in the following year and, between Jan. 29 and Feb. 25 (1944) it sustained five major attacks. It was the objective of two day and two night attacks during March 18-24, including a massive 3360-ton bombing within a space of 30 min. on March 22. On Sept. 12 it was the target of the greatest fire raid theretofore delivered. On March 16 (1945), during the allied advance on the Rhine, the Amer. First Army cut the Ruhr-Frankfort road, thereby putting the city in imminent danger of capture. On the following day Gen. Eisenhower warned the two cities of F. and Mannheim that they would be destroyed from the air—a warning that was not without effect, for on the 26th of that month Gen. Patton's tanks entered the city. F. however had suffered

severely and the sixteenth-century house, No. 23 Grosse Hirschgraben (rebuilt in 1755), in which Goethe was b., was destroyed (rebuilding was commenced in 1948 with the help of old photos and drawings). All around this spot the damage was considerable. The museum close by was also demolished. The once fashionable shops along the Zeil were either demolished or bombed into empty shells. Southward the most anct. part of the old free city, with its narrow streets and quaint houses, lay in ruins. The

The tn. is an important railway centre, and before the Second World War, had a large garrison. There are extensive coal-fields in the neighbourhood. Before the war its chief industries were the manufs. of tobacco, potato-starch, earthenware, machinery, metal ware, chemicals, paper, leather, sugar, and iron and steel goods. Captured by Russian forces under Marshal Zhukov in March 1945. See further under EASTERN FRONT OR RUSSO-GERMAN CAMPAIGNS IN SECOND WORLD WAR. Pop. 72,000.



FRANKFORT
The old market-place and town hall (Römer).

cathedral suffered heavy damage, with the roof gone but for its framework. But its finest feature, the 310-ft. tower, begun in 1415, escaped with minor damage. Near by, the Rörnerberg, the picturesquesque old market-place, was enclosed by mounds of débris and rusting ironwork. The opera house lost its roof and its walls bore great gashes. The Adolf Hitler Haus was gutted. After the war F. became the headquarters of the Amer. zone of occupation, and later of the combined Brit. and Amer. zones and the W. Ger. civil administration. Pop. 550,000.

Frankfort-on-Oder, tn. in the prov. of Brandenburg, Germany, on the Oder, about 50 m. S.E. of Berlin. It contains the Evangelical Marienkirche (Oberkirche), built in the thirteenth century; the Rathaus, dating from 1607, and a monument to the poet Kleist, who was b. in this tn. The univ. of F. founded in 1506, was removed to Breslau in 1811.

'Frankfurter Zeitung,' Ger. Liberal newspaper founded in 1855. Throughout its existence it wielded great influence in Germany. It was the undisputed leading daily authority in the Ger. language on finance, economics, and technology. Until Hitler's advent in 1933 the F. Z. was Jewish-owned, but was then immediately 'aryanised.' Ten years later it was ordered by the Nazis to cease publication. To the last it maintained a level of journalism far above that which was characteristic of Nazi Germany.

Frankincense, or *Olibanum*, gum-resin. It corresponds to the Arab *lubdān*, the fragrant gum of the *Boswellia thurifera*, a tree plentiful in central and S. India. This aromatic gum-resin is yielded by various trees, though pre-eminently of the genus *Boswellia*, which grow on the Soma-liland and Arabian coasts, whence it reaches Bombay. The chief gum-yielding species of *Boswellia*, besides the Indian

B. thurifera, are *B. Freereana*, *B. Bhau-Dajiana*, and *B. Carterii*, all of Somaliland, and a variety of the last-named which grows in the Hadhramaut. It was brought into Palestine by the Arabian merchants (Is. ix. 6; Jer. vi. 20.) and was among the gifts offered by the wise men (Matt. ii. 11). It occurs in round or oblong tears covered with a white dust, and is of a yellowish-brown colour, but some is colourless. It has a bitter taste, and smells like balsam when heated. It burns with a bright flame and fragrant colour, and is used in incense (Exod. xxx. 34, etc.), fumigating powders, and in the composition of stimulating plasters, etc.

Franking of Letters, term used for the right of sending letters free of charge. This privilege was claimed by the House of Commons in 1660, but it was not until 1761 that an Act was passed which made the practice legal. After this date every member of Parliament was allowed to send ten letters a day free of charge, and to receive fifteen. The privilege was abused, and was finally abolished in 1840, on the introduction of the penny postage. In the U.S.A. franking was instituted in 1776, and remained in force until 1873; was then abolished, but later restored.

Frankland, Sir Edward (1825-99), Eng. chemist, b. at Churchtown, near Lancaster. Worked under Bunsen at Marburg. In 1851 he was appointed prof. of chem. at Owens College, Manchester. He was lecturer in chem. at St. Bartholomew's Hospital for a time, and in 1863 prof. of chem. at the Royal Institution. He devised new methods of water analysis, publishing on this subject *Water Analysis for Sanitary Purposes*, and when appointed a member of the Royal Commission on the pollution of rvs. in 1868 did good work. He discovered the theory of valency, which theory played an important part in the subsequent growth of chemistry; and jointly with Sir Norman Lockyer was responsible for the conclusion that the external layers, or photosphere of the sun are composed of gases and vapours, as well as for the discovery of helium. The highest honour of the Royal Society, the Copley Medal, was awarded to him in 1891. He was knighted in 1897.

Frankland, Percy Faraday (1858-1916), Eng. chemist, b. in London. He was educated at Univ. College School, the Royal School of Mines, and Wurzburg Univ. He was demonstrator and lecturer in chem., Royal School of Mine, (1880-1888); prof. of chem., Univ. College, Dundee (1888-94), Mason College, Birmingham (1894-1900), and Birmingham Univ. (1900-18). He was formerly examiner in chem. to the London Univ., and was made president of the Chemical Society in 1911. He did much research, and his memoirs—pub. in the *Philosophical Transactions Royal Society*, etc., dealing with chemical aspects of fermentation, the application of bacteriology to air, water, and the sand filtration of water, and the bacterial treatment of sewage—show in what direction. He also pub. *Agricultural Chemical Analysis* (1883); *Our Secret*

Friends and Foes (1894); *Micro-organisms in Water* (1894); *Life of Pasteur* (1897); besides many other articles on fermentation, etc.

Franklin, Benjamin (1706-90), Amer. statesman, b. in Boston, Massachusetts, on Jan 17. He was the fifteenth child in a family of seventeen, and after two years at school he was apprenticed to a printer at the age of twelve. He learnt his trade thoroughly, and at the same time became acquainted with the work of editing a newspaper. In 1725 he sailed for England, where for eighteen months he worked in a printer's office. On his return to America he started business as a printer. In 1729 he bought the *Pennsylvania Gazette*, and was so successful in editing the paper that three years later he brought



BENJAMIN FRANKLIN
Lithograph by J. A. Thompson after the original painting by J. A. Duplessis.

out *Poor Richard's Almanac*, which he continued to issue for twenty-five years, and which became famous in the Amer. colonies for F.'s pithy maxims on the virtue of thrift and hard work.

About this period of his life he made many scientific investigations. He established the identity of lightning with electricity, by means of his famous demonstration with a boy's kite, and suggested the use of lightning conductors on large buildings. Amongst his scientific researches, two very useful pieces of work were the discovery of the Gulf Stream and of its course, and the discovery of the course of the storms that cross the continent of N. America.

He began to take a prominent part in the political life of Pennsylvania. In 1737 he was postmaster of Philadelphia and from 1751 to 1764 was a member of the colony's legislative body. As early as 1754 he was ardently advocating an inter-colonial union, the better to present their claims to the Eng. Gov. In 1757 he was drawn away from his scientific work by the urgency of the political situation in Pennsylvania. In that year he was sent to London to represent the grievances of the colony with regard to taxation. In

that mission he was so successful that in 1771 he was again sent, this time to protest against the Stamp Act. In 1775 he returned to America and helped to draw up the Declaration of Independence. During the war of Independence he represented the states in Europe. In 1778 he was recognised as minister of the U.S.A. by France. He brought about the treaty of Paris, and was instrumental in obtaining a good deal of help for the states. It was mainly through his diplomacy that France was brought into the war. At the close of the war he remained in Paris as minister of the states, and then returned to take part in framing the constitution of the new nation.

J. Bigelow has ed. a complete ed. of F.'s works. Except for his early journalistic writings and his famous autobiography these are mainly in the form of private letters. Even his scientific discoveries were made known to the world through his letters to his friends. His autobiography was ed. by John Bigelow and pub. in 1888. The 'Complete Edition' was produced by Bigelow in 1887-89, but the best ed. is the Centennial, by A. H. Smyth (10 vols., 1905-7). See W. C. Bruce, *Benjamin Franklin Self-revealed*, 1917; P. Russell, *Benjamin Franklin, the First Civilised American*, 1926; C. van Doren, *Benjamin Franklin: a Biography*, 1939; and Everyman's Library ed. of the *Autobiography*.

Franklin, Sir John (1786-1847), Arctic explorer, was b. at Spilsby in Lincolnshire. He entered the R.N. on board the *Polyphemus*, and took part in the battle of Copenhagen in 1801. Two months later he was appointed midshipman to the *Investigator*, under Capt. Matthew Flinders, and showed remarkable ability for nautical observations on the voyage to Australia. He was present with Commodore舞Dance in his engagement with Linois in 1803, and took part in the battle of Trafalgar in 1805. Two years later he joined the *Bedford*, and sailed in that ship in the expedition against New Orleans in 1814, where he was wounded. In 1818 he was appointed to command the *Trent*, and accompanied Capt. Buchan in a voyage of discovery in the Arctic regions. In 1821 he was elected a fellow of the Royal Society. From 1825 to 1827 he was again occupied in exploring the Arctic regions, and on his return to England was knighted. From 1836 to 1843 he was governor of Van Diemen's Land (Tasmania). In 1845 he set out in the *Erebus* with Capt. Crozier in the *Terror* to discover a N.W. passage to the Pacific, and his ships disappeared into the unknown N., having last been seen near the entrance to Lancaster Sound. In the ensuing ten years over forty expeditions were sent to clear up the mystery of their fate, and only gradually was their tragic story pieced together (1851). After spending almost eighteen months in the ice near King William Is., F.'s party abandoned the ships and tried to march out to safety. Not a man survived. But F. left a name as the greatest single leader in the story of hazardous adven-

tures in the Arctic. He showed the existence of the N.W. passage, and his work resulted in the discovery of a second N.W. passage in 1850. He wrote *Narrative of a Journey to the Shores of the Polar Sea, 1819-22* (1823). See also ARCTIC EXPLORATIONS. See A. H. Beesly, *Franklin, 1881*; J. H. Skewes, *Franklin: the True Secret of the Discovery of his Fate*, 1889; H. D. Traill, *Life of Franklin*, 1896; and W. F. Rawnsley (ed.), *The Life, Diary, and Correspondence of Jane, Lady Franklin*, 1923.

Franklin, landowner of free but not of noble birth in fourteenth and fifteenth centuries in England. In status he was above the villeins. There is a F. in Chaucer's *Canterbury Tales*, and the word also occurs in Scott's *Ivanhoe*.

Franklin: 1. Tn. in Norfolk co., Massachusetts, U.S.A., about 27 m. S.W. of Boston. It has a public library containing books contributed by Benjamin F., in whose honour the tn. received its name. The chief manufs. are straw goods, felt, cotton, and woolen goods. Pop. 7300. 2. City in New Hampshire, U.S.A., about 95 m. from Boston, at the confluence of the Pemigewasset and Winnipesaukee Rs. to form the Merrimac. The rvs. furnish good water power, which is extensively used in the manufs. The chief are paper and pulp, and hosiery. Daniel Webster was b. here, and the house is used as a museum. F. was first settled in 1748 and incorporated as a city in 1895. Pop. 6700. 3. Tn., cap. of Venango co., Pennsylvania, U.S.A., about 35 m. from Erie. It is the centre of the chief oil region of the state, and manufs. boilers, engines, steel castings, and iron goods. Pop. 9,900. 4. Dist. in N. Canada, named after Sir John F., which includes Banks, Prince Albert, Victoria, Wollaston, King Edward and Baffin Land, Melville, Bathurst, Prince of Wales, and Cockburn Is. Its area is about 500,000 sq. m.

Franklin Institute, founded in 1824, and located in Philadelphia, Pennsylvania, U.S.A., is the oldest school in the U.S.A. for the study of the mechanical arts and applied sciences. It owns the finest technical library in the country. Its medals and certificates of awards to those who have done most to advance the physical sciences in their application to inventions are highly prized.

Frank-marrige, species of estate tail in old Eng. law whereby a freeholder granted land to his daughter or cousin or near blood relation on her marriage, to be held by her and her husband and the heirs begotten of their two bodies, free from all manner of service, except fealty to the donor or his heirs.

Frankpledge. From the earliest times in England there was a custom whereby a man's relations were responsible for his behaviour; out of this grew the principle of forming institutions for mutual security. A number of men formed an association in which they were answerable each for the others; if one committed a crime, the others were liable for his appearance to make reparation, and if he disappeared, themselves had to pay the penalty unless

they could prove their innocence. These societies were called *frittbörs*, or peace-pledges, and the Normans mistranslated the A.-S. words by F.

Franks, Sir Oliver Shewell (b. 1905), Brit. scholar and diplomatist, son of the Rev. S. R. F., author and lecturer on theological works. Educated: Bristol Grammar School, and Queen's College, Oxford. Fellow and Prelector there, 1927-37. Tutor, 1933-37. Univ. lecturer in philosophy, 1935-37. Visiting prof., univ. of Chicago, 1935. Prof. of moral philosophy, univ. of Glasgow, 1937-45. Temporary civil servant at the Ministry of Supply, 1938-46. Permanent secretary, Ministry of Supply, 1945-46. Ambas. to Washington, U.S.A. from 1948.

Franks, The, name given to a confederation of Germanic tribes who inhabited the lower and middle Rhine valley during the third century A.D. The tribe may be divided into two main groups, the Salian F. who dwelt on the lower Rhine, and the Ripuarian F. on the middle Rhine. The chief tribes were the Attuarii, Salii, Sigambri, Chatti, and Bructeri. Towards the end of the third century they began to move W. About 350 the F. were defeated by the Emperor Julian and became a dependency of Rome, but when Clovis (481-511) became their king, the Rom. yoke was thrown off. Clovis defeated the Alemanni round the R. Seine in 495, and by 501 obtained an ascendancy over the Ripuarian F., thus considerably extending his empire and forming the nucleus of the kingdom of France. During his rule, also, the F. adopted Christianity, but remained subject to their Sali law. They obtained military supremacy in N. Gaul and founded the first dynasty of Fr. kings. By 597 they were divided into the Austrasian and Neustrian F., who continually struggled for ascendancy over each other, the Merovingian dynasty being finally superseded (752) by the Carlovingian. The F. were a democratic tribe. There were only two social grades, the free F. and the captive slaves taken in the fight. At the head was a king, who, with the help of his counts, saw to the execution of the laws drawn up by the great council. They were a martial race, but in time of peace tilled the soil. See L. Segeant, *The Franks*, 1898; L. Schmidt, *Geschichte der deutschen Stämme bis zum Ausgang der Völkerwanderung*, 1941.

Franz, Robert (1815-92), Ger. composer, b. at Halle. Suffered in early life from the opposition of his parents to a musical career, but eventually was allowed to go to Dessau to study organ-playing under Schneider. In 1843 he brought out a book of songs, which subsequently was followed by nearly fifty other books, containing altogether about 250 songs. The first book was highly praised by Schumann and Liszt, and F. became famous. The songs are mostly for mezzo-soprano voice, lyrical, and finished in execution. Unhappily deafness began to afflict F. before he was thirty, while, owing to a nervous disorder, he had to resign his post of organist to the city of Halle and his other offices. But his future was provided for

by the proceeds of a concert tour arranged by Liszt and others. In addition to songs F. ed. Astorga's *Stabat Mater* and Durango's *Magnificat*. He also pub. an 'open letter' to the critic and bitter opponent of Wagner, Hanslick (1871), on his methods of editing the classics.

Franzén, Frans Michael (1772-1847), Swedish author, b. in Uleåborg, Finland. In 1798 he was prof. of literature, in 1801 prof. of hist., and in 1808 was elected a member of the Swedish Academy. On the cession of Finland to Russia he went to Sweden, and became in 1831 bishop of Härnösand. He was a writer of both poetry and prose, but his shorter poems are perhaps his best work, being very beautiful in their simplicity; his songs, too, were very popular, one of them winning the prize in the Swedish Academy in 1797.

Franzensbad, or Františkovy Lázně, tn. and watering-place of Bohemia, Czechoslovakia. It is situated between the spurs of the Fichtelgebirge, the Bohmerwald and the Erzgebirge, and possesses mineral springs which are much resorted to by sufferers from nervous disorders. The mineral waters are also exported in bottles, in normal times 300,000 a year. Pop. 4000.

Franz Josef, see FRANCIS JOSEPH.

Franz Josef, or Lomonossov, Land, archipelago in the Arctic Ocean, situated about 250 m. to the E. of Spitsbergen. It is described as a lofty glacier-covered land reaching an elevation of 2100 ft., and is comprised of some sixty ls. which are volcanic. It was discovered by Payer and Weyrecht in 1873, and was explored by Leigh Smith in 1881 and 1882. In 1894 Alfred Harnsworth (later Lord Northcliffe) fitted out an expedition under the leadership of F. G. Jackson. The party landed near Cape Flora, and spent the summer of 1893 exploring the coast to the N.W. They reached Cape Richthofen in 1896, and named the expanse of water to the N. Queen Victoria Sea. In June of the same year they met Nansen on his southward journey, and bade him the *B iudeard* for his homeward voyage. In 1897 Capt. Robertson of Dundee made discoveries in F. G. L., and Wyche's Land was circumnavigated by Pike and Crossley. In 1898 an expedition under Wellman landed at Cape Tegetthoff and defined the E. extension of the archipelago. In 1899 the duke of Abruzzi made his way to Crown Prince Rudolf Land and wintered in Tepilitz Bay; the party reached 86° 33' N. lat., 240 m. from the Pole. In 1903 the Zeigler expedition went N. by this route. In 1928 F. G. L. was annexed by the U.S.S.R. and it was renamed Lomonossov Land. A meteorological observation post, the most northerly in the world, was set up in 1929, on Hooker ls.

Frascati, tn. of Italy in Rome, situated on the Alban Hills, nearly 1000 ft. above sea-level, and 15 m. S.E. of the city of Rome. It is a popular summer resort, and there are numerous beautiful villas, among which may be mentioned Aldo-brandini, Torlonia, etc. It is noted for

its market gardens and its wine trade. F. is built on the site of the anct. Tusculum. In the Second World War the cathedral interior was wrecked and the façade pitted. The churches of S. Rocco and Gesù were half destroyed and all the other churches damaged; the Seminario was demolished, and the Municipio badly hit; and the villas Torlonia, Aldobrandini, Falconieri, Ruffinelli, and Lancellotti were all seriously damaged, the first-named being Kesselring's headquarters. Civilians subsequently ransacked and wrecked the entire building of the Villa Torlonia and grounds. Pop. 10,000.

Fraser of North Cape and Molesley, Bruce Austin Fraser, first Baron (b. 1888), Brit. admiral, son of Gen. Alexander F., R.E. Educated at Bradfield School. Flag captain, E. Indies. Commanded the *Glorious* (see AIRCRAFT CARRIER); chief of staff, Mediterranean Fleet; Third Sea Lord and Controller, 1939-42. Second in command, home fleet, 1942; commander-in-chief home fleet, 1943-44. Admiral, 1944. Commander-in-chief, eastern fleet, 1944; of the Pacific fleet, 1945-46. Commander-in-chief, Portsmouth, 1947-1948. On Dec 26, 1943, the great Ger. battle cruiser *Scharnhorst* (q.v.) was brought to action and sunk off N. Cape, Norway, by units of the home fleet under the command of F., which were escorting to Russia a convoy of exceptional importance. In Aug. 1949 he was appointed First Sea Lord in succession to Admiral of the Fleet Sir John Cunningham.

Fraser, Peter (b. 1884), Brit. statesman, b. at Fearn, Ross-shire, Scotland, and educated at a board school. Began political activities as a local officer of the Liberal party. In 1908 he joined the I.L.P. in London. Emigrated to New Zealand, 1910. Played a prominent part in the Labour movement there. Member of the House of Representatives for Wellington Central since 1918. Member of Wellington City Council, 1919-23 and 1933-36; and of Wellington Harbour Board, 1933-38. Minister of education, health, marine, and police, 1935-40. Prime Minister since 1940; also minister of external affairs and of fisheries of New Zealand since 1943. During the Second World War he attended meetings of the War Cabinet in London. New Zealand delegate to Empire Parl. Association Conference, 1935. Led the New Zealand delegation at the San Francisco Conference (q.v.), 1945, and again at the first meeting of the United Nations Assembly, 1946. In a general election at the end of Nov. (1946) F. was returned to office, but only by securing the four Maori seats, having divided equally with the National party. The result was interpreted as a rebuff to the Radical wing of Labour, and as giving a mandate to F. to pursue his humanitarian policies rather than any further extension of direct nationalization. In 1947 F.'s gov. passed sov. measures into law, of which the most important was one by which the State took over all insurance relating to workmen's compensation. An 'aid to Britain' conference was held at Wellington in Aug. and initiated a sub-

stantial programme of economy and increased production designed to help the United Kingdom in its financial difficulties.

Fraser, Simon, see LOVAT.

Fraser, chief riv. of Brit. Columbia, rises in the Rocky Mts. in the vicinity of the Yellowhead pass, and flows in a N.W. direction for 277 m. to Giscombe, where it makes a turn almost due S. through the centre of the province for 413 m. to Hope. Here it turns again and continues W. for 95 m. to empty at New Westminster into Georgia Strait. At Lytton, 65 m. N. of Hope, the riv. is joined by its largest trib., the Thompson, and from this point the lines of the Canadian Pacific and Canadian National Railways run along the banks to the coast. Scene of the earliest gold discoveries (1858) in the province around Quesnel and Williams Creek, the F. is now famous for its salmon fishery. The F. valley, which extends almost from Hope to the confines of Vancouver, is notable for its fertility, and supports a large farming and dairying population. In 1948, when the riv., swollen by melting snows from the Rocky and Cascade Mts., rose some 26 ft. above summer level, the valley suffered severely from flood. Named after Simon Fraser, who explored it in 1808, the F. has a length of 785 m. Its chief tributaries are the Morkill, Bowron, McGregor, Willow, Salmon, Nechako, Blackwater, Cottonwood, Quesnel, Chilcotin, Bridge, Thompson, Harrison, and Pitt.

Fraserburgh: 1. Seaport tn. in Aberdeenshire, Scotland, on the S. side of Kinaird's Head, and W. of F. Bay. It is noted for its herring fishery, and has considerable export and import trade. It has a good harbour. Originally called Faithie, the name was afterwards changed to F. in honour of its founder Fraser of Philorth. Pop. 10,200. 2. Tn., Cape of Good Hope, S. Africa, is the cap. of a dist. of the same name. Pop. of dist. 6,500, of tn. 700.

Fraser's Highlanders, see under SARTORII HIGHLANDERS.

Fraser Island, or Great Sandy Island, off the S. coast of Queensland, Australia, stretching from Wide Bay to Hervey Bay. There is excellent fishing.

Frasererville, or Rivière du Loup en Bas, watering-place in Temiscouata Co., Quebec, Canada, is near the junction of the Rivière du Loup with the St. Lawrence. The prin. industries are leather manufs. and tanning, and there are cotton mills. The Fraser Institute is situated here. Pop. 8000.

Fraternities, societies of students in nearly all the colleges of the U.S.A., with the object of promoting social intercourse, good scholarship, and athletic ability. There is little secrecy in their organisation beyond measures taken to protect their constitutions and mottoes. They are spoken of as Gk. Letter F., as Gk. letters are used to name each fraternity. Each fraternity has a distinguishing badge bearing symbols and monograms. F. are divided into chapters, one (but not more) of which is in each college. The first society, the Phi Beta Kappa, was organ-

ised at Wm and Mary College 1776 There are over forty men's general F with a total membership of more than 2 500 000, twenty women's general F with a total membership of 50 000 There are also medical legal and honorary F See Baird *American College & Fraternities* 1898

of Assist they refused to submit to the authority of the church and formed a separate organisation, professing poverty, and having no settled abode They were suppressed spasmodically by church and civil authorities in the fifteenth century at times the death penalty being inflicted on their leaders



THE FRAZER RIVER IN BRITISH COLUMBIA

THE FRASER RIVER AT HELL'S GATE

Fratellini, name of a famous family of clowns which has been called the dynasty of clowns (Gustave I was the first of the family to work in a circus). The elder of his sons who appeared in London in the first decade of this century had two sons who performed together with their brother in law as a trio of clowns. Good though they were, they were eclipsed by the world wide celebrity of their cousins, the family of Gustave's younger son. This latter family appeared in England in C. B. Cochran's revue *Dover Street to Dixie*, the three being Paul Albert and Francois. In Paris they were idolised and were almost an institution at the Cirque d'Hiver. Paul (d. 1940) was the simple fellow with the large red nose who played the bombardon.

Fraticelli, or Frérots (Little Brethren) name of certain misguided religious sectaries of the fourteenth century. Claiming to be the true followers of Francis

Fratres Arvales, see ARVAL BRETHREN. Fraud is, in term of such wide meaning that it may be said to be implied in every civilly or criminally wrongful act which by one person is prejudiced by the deception of another. To sustain an action of deceit *c. l.* the person aggrieved must prove (1) the statement was untrue in fact and made apparently or in reality with the intent that he should act upon it (2) the person who made it either knew of its falsity or was recklessly and consciously ignorant whether it was true or not and (3) he (plaintiff) acted upon it and in consequence suffered damage. It is not essential to an action of F that express words should have been used by the defendant, if by his conduct suggestions or active concealment of something material, he causes the plaintiff to be misled. But a *suppressio veri* (suppression of truth) is only regarded as tantamount to F where the withholding

of that which is not makes that which is stated absolutely false. Merely allowing a man to continue to act on an erroneous assumption is not defrauding him if the other person in no way contributed to such error. Generally speaking, however, F. implies a misrepresentation of existing fact. A principal is liable for the F. of his agent where committed in the cause of the principal's business and ostensibly for his benefit; a husband is liable for his wife's F., and a partner for that of his co-partner. A contract induced by F. is voidable at the option of the defrauded party, for *fraus vitiat omnia* (F. vitiates everything), and, besides rescinding the contract, he is also entitled to damages, but he may, if he choose, leave the contract subsisting and at the same time sue for any damage he has suffered. In accordance with the above maxim it has long been settled that F. in all courts and at all stages of any particular transaction, if proved, at once vitiates the transaction.

Formerly, false statements made negligently but without active deceit, or false statements made on insufficient grounds, were held to amount to what was called 'legal F.' But the rule now is that no false statement made with an honest belief in its truth can render the maker liable for F. In consequence of this ruling (which is to be found in the classic case of *Derry v. Peek*), the Directors' Liability Act, 1890, makes directors and promoters of a company liable in damages for innocent misstatements in a company prospectus, inviting the public to subscribe to shares where such statements were made without reasonable grounds for believing in their truth.

In the criminal law many offences necessarily imply F. (as to civil remedies for crimes see under CRIMINAL LAW), e.g. obtaining by false pretences, embezzlements (*q.v.*), and all unlawful appropriations by all manner of agents, trustees, and others entrusted with property. In a charge of falsifying accounts it is not necessary to show that any particular person was intended to be defrauded. As to rendering void fraudulent conveyance by a bankrupt as against his creditors, see under CONSIDERATION.

Frauds, Statute of, 1677. The object of this Act was the prevention of fraud, but it is a legal aphorism that it promotes fraud more often than it prevents it. The statute renders certain classes of contracts unenforceable unless evidenced by writing (as to the five classes see under CONTRACTS). Unless contracts of the classes in question are so evidenced they can only be enforced (where the circumstances allow) by the aid of the equitable doctrine of 'part performance.' That doctrine applies where one party to a contract, generally for the sale or purchase of land, including house property, seeks to compel the other party to fulfil his promise to buy or sell and has himself done something in fulfilment (part performance) of his side of the contract in the confidence that the other party would adhere to his promises. Equity in such a case looks upon such acts of part performance, if it is clear that they could

only be referable to the contract relied upon, as evidence of the formation of such a contract in spite of the absence of writing. A case frequently cited as an illustration of the kind of acts of alleged part performance that would not be so exclusively referable is that of *Maddison v. Alderson*, where the plaintiff, a housekeeper, who had remained for long in the service of a certain gentleman, sought to make his estate liable after his death for an alleged gift of land to her in consideration of her remaining in his service. It was held that her service was not exclusively and unequivocally referable to the promised gift, and therefore not sufficient evidence of a promise in the absence of writing. Comments in the court of appeal by Lord Justice Mackinnon suggested that this ancient statute stands in need of amendment owing to the obscurity of its provisions and the injustices arising out of its application. The question whether legislation should be introduced to repeal the section (4) of the Statute of Frauds which remains outstanding, and the other legislation on the same matter formed the subject of a recommendation of the Law Revision Committee, and was under consideration when war broke out (1939). Further consideration of this complex question was postponed by war conditions.

Frauenfeld, cap. of the Swiss canton Thurgau, situated on the Murg. It has a tenth-century castle. The manuf. are cottons, silks, woollens, and iron and aluminium goods. Pop. 10,000.

Frauenlob, see HUTRYCH VON MEISSEN.

Fraunce, Abraham (fl. 1587-1633), Eng. poet, the dates of whose birth and death are uncertain. He was educated at Cambridge, at the expense of Sir Philip Sidney, and, after studying law at Gray's Inn, was called to the Welsh Bar. He is chiefly remembered for his *Lamentations of Aminta for the Death of Phillis* - a translation of Thomas Watson's version (1585) in Latin hexameters of Tasso's pastoral drama *Aminta*, and other writings, the chief of which are *The Countess of Pembroke's Urychurch* (1591) - which consists of a reprint of his *Lamentations*; *The Countess of Pembroke's Emanuel* (1591), a poem on the Nativity, Passion, Burial, and Resurrection; and a third part to these, *Aminta Dale* (1592), which contains 'the most corrected tales of the Pagan Gods.' F. is of interest in the hist. of Eng. prosody because he belonged to the Cambridge group, including Gabriel Harvey and his brother Richard, which attempted to force upon Eng. poetry the classical metres; and all his poems are in hexameters.

Fraunhofer, Joseph von (1787-1826), Ger. optician, b. at Straising in Bavaria. His father was a glazier, and he was apprenticed to a glass polisher, but he accidentally came into the possession of a sum of money which permitted him to start in business for himself. In his leisure he pursued scientific investigations in mathematics and optics. By the help of Utzschneider he obtained the position of optician to the mathematical Institute at Munich, and succeeded in making

achromatic glass for telescopes of such excellence that his fame spread all over Europe. The great telescope at Dorpat was made by him: he also discovered the dark lines in the sun's spectrum which bear his name. Conservator of cabinet of natural curiosities at Munich. See P. Lenard, *Grosse Naturforscher*, 1929.

Fraunhofer Lines, fine black lines crossing the solar spectrum, first observed by Wollaston in 1802, and later studied by Joseph von Fraunhofer (q.v.). The lines correspond to the wave-lengths of light absorbed in the reversing layer of the sun.

Fraustadt (Polish *Wszowa*), tn. of Poland (formerly of Germany) in the prov. of Posuan, about 14 m. N.E. of Glogau. Here, in 1706, Charles XII. of Sweden gained a victory over the Saxons. The tn. is noted for its tanneries, sugar factories, and dye works. Pop. 7500.

Fraxinus, see Ash.

Fray Bentos, or **Independencia**, tn. of Uruguay, and cap. of Itio Negro. It is on the Uruguay R., about 170 m. N.W. of Montevideo. The tn. is engaged in the manuf. of extract of meat and canning. Pop. about 5000.

Frazer, Sir George James (1854-1941), Scottish author, b. at Glasgow; educated at Glasgow Univ. and Trinity College, Cambridge. Elected to a fellowship at Trinity College in 1879. At first his studies were classical, but he took a new line in 1887 with a book on *Totemism*. In 1890 appeared *The Golden Bough* (2nd ed. 1900; 3rd ed. in 11 vols. 1911; supplementary index vol. 1914; abridged form, 1922), which instantly brought him fame. This masterpiece of anthropology and scholarship has profoundly influenced the modern outlook on belief in the supernatural and on religious ritual. Much of his other work was also concerned with the same anthropological interests. Went to Greece for the preparation of an ed. of Pausanias, the Gk. geographer, which appeared as *Pausanias's Description of Greece, translated with a Commentary* in 1898 (2nd ed. 1913), and *Pausanias and other Greek Sketches* in 1900. In 1907 he was appointed prof. of social anthropology to the univ. of Liverpool. Delivered his first Gifford lectures at St. Andrews in 1911, choosing as his subject *Belief in Immortality and the Worship of the Dead*. In 1912 he ed. a selection of *Couper's Letters* (with notes by J. F. Drayner). Knighted, 1914. O.M., 1925. Numerous honorary degrees. In 1920 he was elected a fellow of the Royal Society, having given up his Liverpool fellowship in 1919. His later work included a trans. of Apollodorus in the Loeb Library and an ed. of Ovid's *Fasti* in 5 vols. in 1929. Much charm invests his theories of kingship, magic, and tree worship, woven out of his fundamental belief in man's essential ignorance. With F. religious beliefs took their place among other natural phenomena as a subject for dispassionate investigation. Creed and mythology were but one manifestation among many of an all but universal cult, which originated neither in Judea nor in revelation, but in the earliest efforts of primitive man to

influence by magic the seasons and stars in their courses and the fecundity of nature. It has been well said that he did for our time what Lucretius did for his—emancipated us from the most crushing form of fear through idol-worship. F. felt himself to be a disciple of Darwin, but where Darwin traced the origins and evolution of our physical bodies, F. gave us the record of our mental growth. But his interest in ritual was always slighter than his interest in myth; and he ignored altogether the influence of economic motive in the evolution of primitive society. Only time can show how far his theories will enjoy universal assent. Already Rivers and the diffusionists have challenged the assumption which F. inherited from Taylor—that if the thinking and institutions of primitive societies the world over reveal remarkable similarities, the explanation must be sought solely in the identical working of the human mind. His other works include *Lectures on the Early History of the Kingship* (1905); *Adonis, Attis, Osiris: Studies in the History of Oriental Religion* (1906; 3rd ed. 1914); *Questions on the Customs, Beliefs, and Languages of Saracens* (1907); *Psyche's Task* (1909); *Totemism and Exogamy* (1910); *The Belief in Immortality*, etc. (1913); *Essays of Addison*, ed., (1915); *Folk-lore in the Old Testament* (1918); *The Worship of Nature*, I. (1926); *Myths of the Origin of Fire* (1930); *Aftermath: a Supplement to the Golden Bough* (1936); *The Bear of the Dead in Primitive Religion* (1936); *The Gorgon's Head* (1937); and *Totemica: a Supplement to Totemism and Exogamy* (1937).

Frazer Island, or **Great Sandy Island**, see **FRASER ISLAND**.

Frechen, vil. of the Rhineland, Germany, 22 m. S.S.W. of Dusseldorf. Earthenware is manufactured here. Pop. 15,500.

Fréchette, Louis Honoré (1839-1908), Fr. Canadian poet, b. at Lévis, Quebec. He was called to the Canadian Bar (1864), but entered upon a journalistic career in Chicago. In 1874 he was elected to the Dominion Parliament, but was defeated at the election of 1878. He ed. *La Patrie*, made sev. trans. from the Fr., and wrote *Mes Loisirs* (1863), *La Voix d'un exilé* (1867), *Les Oiseaux de l'île* (1880), and the two historical dramas, *Papineau* (1880) and *Félix Pontre* (1880). He was elected president of the Royal Society of Canada.

Fredegond, **Fredegunde**, or **Fredegunda** (c. 515-57), Frankish queen, first mistress and then wife of Chilperic, king of Neustria. She parted Chilperic from his first wife, Andovere, whose servant she had been, but he then married Galsvintha. F. was suspected of murdering her in the same year (567), and became her successor. This caused war between Chilperic and his brother Sigebert of Austrasia, whose wife, Brunhilda, was sister to Galsvintha. F. had Sigebert assassinated at Vitry (573), and made away with all who stood in the way of the succession to the throne of her own son, Clotaire II. After the murder of Chilperic in 584, she carried on war

against Brunhilda and her descendants, but failed to kill the queen, and d. during the campaign.

Fredericia, seaport of Denmark, on the S.E. coast of Jutland, at the N. entrance of the Little Belt and the Little Belt bridge. It manufactures, chemicals, iron, silver, and other metals, condensed milk, soap, and toys; is an important communication centre (railway, telegraph, telephone), and has considerable shipping trade. The principal exports are meat, fish, and eggs; imports, pottery, salt, and petroleum. The permanent buildings of the Dan. Industries Fair are situated here, and so is a college for the deaf and dumb. It has had an exciting past. The fortress was stormed by Swedes in 1657. In 1849 the Dan. garrison broke a siege by the army of Schleswig-Holstein, but in 1864 the tn. was evacuated by the garrison after bombardment and siege by the Austrians. Pop. 23,000.

Frederick I. (c. 1122-90), head of the Holy Rom. Empire, 1152-90, surnamed **Barbarossa** or **Redbeard**. He was the son of Frederick II. of Hohenstaufen, duke of Swabia, and succeeded his father as duke of Swabia in 1147, and his uncle Conrad III. as king of Germany in 1152. He reduced Germany to order during the early years of his reign, and then proceeded to establish the imperial authority in Italy. At Pavia he received the Lombard crown, and in 1155 was crowned emperor in Rome by Adrian IV. Four years later began the long contest between F. Barbarossa and Pope Alexander III., Adrian's successor. Various struggles and treaties ensued; but at last, in 1177, F. made his peace with the pope, and was enabled to turn his attention to Germany, where he had to contend with Henry the Lion, duke of Bavaria and Saxony, head of the house of Guelph. He, however, succeeded by his energetic measures in crushing the Guelph power in Germany, and in 1189, having settled the affairs of the empire and established universal peace in his dominions, he resigned the gov. to his eldest son, Henry, and put himself at the head of the third crusade. He won two great victories over the Moslems, but was drowned in a small stream in Cilicia in 1190. On the whole the reign of F. was a happy and prosperous time for Germany. He encouraged the growth of towns, and took strong and successful measures to establish order. He is said to have taken Charlemagne as his model. His memory in Germany is cherished as that of the best and greatest of his race. See H. Prutz, *Kaiser Friedrich I.*, 1871-73; N. von Bunau, *Leben und Thaten Friedrichs I.*, 1872; V. Chevallier, *Répertoire des sources historiques du moyen âge*, 1904; and R. Wahl, *Kaiser Friedrich Barbarossa*, 1941.

Frederick II. (1194-1250), Holy Rom. emperor, son of the Emperor Henry VI. and Constance, heiress of Sicily, and grandson of the Emperor Frederick I., thus a member of the Hohenstaufen family, b. near Ancona in Italy. On his father's death he was crowned king of Sicily at Palermo (1198), and on the death of his mother in the same year, Pope Innocent

III. became his guardian and regent of Sicily. He was elected head of the Holy Rom. Empire in 1212 on the excommunication of Otto IV., and his coronation took place in 1215 at Aix-la-Chapelle. Three years later, on the death of Otto, F. became undisputed ruler of Germany, and adherents gathered around him. In 1228 he entered on a crusade, and set sail for Palestine, and by a treaty made in 1229 he secured the possession of Jerusalem, Bethlehem, Nazareth, and the surrounding neighbourhood, crowning himself king of Jerusalem. During his absence the new pope, Gregory IX., had devastated his possessions in Italy, but his efforts failed to arouse serious opposition in Sicily and Germany, and F., on his return, had no difficulty in driving back his enemies, and a peace was patched up between pope and emperor at San Germano. In the ensuing struggle, however, F. neglected his duties in Germany, and, aided by the Lombard cities and many Ger. nobles, the papacy at length won the day. F. was famed for his wide knowledge and learning, and his chief claim to fame is as a lawgiver. See G. Blondel, *Étude sur la politique de l'empereur Frédéric II. en Allemagne*, 1892; and K. Hampe, *König Friedrich II.*, 1935.

Frederick III. (1415-93). Holy Rom. emperor, b. at Innsbruck in the Tyrol, son of Ernest of Hapsburg, duke of Styria and Carinthia. In 1440 he was chosen Ger. king at Frankfort under the title of Frederick IV., and in 1463 he united Upper and Lower Austria under his rule, taking the title of Frederick V., archduke of Austria. He had been crowned emperor at Rome in 1452. His reign covered a difficult period—Hungary and Italy were invaded by the Turks, and Vienna was occupied by the Hungarians. He, however, managed to dispose Charles the Bold, who wished to secure the royal title, and gradually reunited the family tcs. of the Hapsburgs, the marriage of his son Maximilian with Mary, daughter and heiress of Charles the Bold, duke of Burgundy, rendering the Hapsburg family one of the greatest dynasties in Europe. F. was a listless and incapable ruler, though he had many excellent personal qualities. He had a real love of learning, and towards the end of his reign handed over the government of his lands to his son Maximilian, retiring to Linz, where he passed his time in study. See Aeneas Sylvius (later Pope Pius II.), *Historia rerum Friderici*, 1485; and V. von Kraus, *Deutsche Geschichte im Ausgang des Mittelalters*, 1905.

Frederick I. (1369-1428), elector and duke of Saxony, surnamed 'the Pugnacious,' son of Frederick the Stern of Meissen. He won distinction as a soldier, and as a reward for his successes against the Hussites the Emperor Sigismund made him duke of Saxony, 1423. The Hussites crushed him, however, at Aussig three years later (1426). In 1409 he founded Leipzig Univ. See life by G. Spalatin, in *Scriptores rerum Germanicarum praecipue Saxoniarum*, II. (Mencke's ed.), 1728-30; C. Böttiger and T. Flathe, *Geschichte des*

Kurstaaes und Königreichs Sachsen, 1867-73.

Frederick III. (1463-1525), surnamed 'the Wise,' elector and duke of Saxony, succeeded his father, Ernest, in 1486. He exercised an enormous influence on German politics of the sixteenth century. He founded the univ. of Wittenberg (1502), and called Luther and Melanchthon to chairs in the faculty. He granted toleration to the creed of the reformers, but did not adopt it himself. On the death of Maximilian I. he refused the offer of the imperial crown (1519), warmly supporting Charles V. (then Charles I. of Spain). F. was succeeded by his brother John. See T. Kolde, *Friedrich der Weise und die Auflage der Reformation*, 1881; and P. Klen, *Friedrich der Weise und die Kirche*, 1926.

Frederick I. (1637-1713), first king of Prussia, elector of Brandenburg as Frederick III. (1688-1701). He was the son of Frederick William, the great elector of Brandenburg. His name has become proverbial for vanity and extravagance, but he was loved by his subjects, and a patron of such men as Spener, Francke, Thomasius, and Leibnitz. He founded the univ. of Halle (1694) and the academy of sciences, and was also founder of the Order of the Black Eagle. F. supported the League of Augsburg against Louis XIV., and helped William III. in the revolution of 1688 in England. The Emperor Leopold of Austria granted him the royal title on the eve of the war of the Spanish Succession in return for his support. In 1707 he was elected prince of Neuchâtel. See C. von Ledebur, *König Friedrich I. von Preussen, 1678-84*; II. Tuttle, *History of Prussia*, 1881-88; and W. Pierson, *Preussian Geschichte*, 1898.

Frederick II. (1712-86), known as 'the Great,' son of Frederick William I. of Prussia and Sophia Dorothea, daughter of George I. of England. He was king of Prussia 1740-86. His great wars occurred during the first half of his reign. On the death of the Emperor Charles VI., he invaded Silesia, and in the first campaign gained the victory of Mollwitz. He then allied himself with France, and after the victory of Chotusitz, the peace of Breslau (1742) was concluded, by which Austria ceded most of Silesia to Prussia. Two years later he reopened the struggle, and succeeded in effecting the treaty of Dresden, a repetition of the treaty of Breslau. In 1756 the Hapsburgs formed an alliance against Prussia with France, Russia, Saxony, and Sweden-England, as the enemy of France, siding with F. Then began the great Seven Years war, the outcome of which was the culmination of F.'s military career, but which taxed the kingdom to its utmost. By wise financial measures, however, F. soon placed Prussia on a sound basis, and was enabled to improve its agric. and industrial condition. F. looked upon his power rather as a trust than as a source of personal advantage; this he faithfully discharged according to his lights. Throughout his reign he took the greatest

interest in the improvement of the Prussian army. His political career, character and ideas—as recorded by his letters and conversations in relations with Voltaire, and an analysis of his writings are clearly described by G. P. Gooch in *Frederick the Great: the Ruler, the Writer, the Man* (1947). See H. Tuttle, *History of Prussia under Frederick the Great, 1740-56*, 1888; F. Kugler, *Geschichte Friedrichs der Grossen*, 1846; T. Carlyle, *History of Frederick II. of Prussia*, 1858-1865; F. Longman, *Frederick the Great and the Seven Years War*, 1881; E. Laxisse, *La Jeunesse du grand Frédéric*, 1891; V. Thaddeus, *Frederick the Great*, 1930; and N. Ausubel, *Superman: the Life of Frederick the Great*, 1932.



FREDERICK THE GREAT

Engraved by E. Scriven from a painting by Carlo Vanloo

Frederick III. (1821-88), second German emperor and king of Prussia (March-June 1868), son of William I. of Prussia (first emperor of united Germany), and known as Frederick William before his accession. He studied at Bonn Univ., and travelled widely. He married Victoria, princess royal of England, in 1858, and became crown prince of Prussia on his father's accession, 1861. F. fought in the war with Denmark, 1864; in that with Austria, 1866, being present at the battle of Sadowa. In the Franco-German war he fought successfully at Weissenburg, Worth, and later at Sedan. He took part also in the siege of Paris. F. greatly influenced the founding of the new German Empire, though his plans often differed from Bismarck's. He wrote diaries of his travels, and of the wars of 1866 and 1870-71, and was popularly called by the army 'Unser Fritz.' During his father's illness in 1878 he became provisional regent. His eldest child was William II. His diaries (*Tagebücher*, 1818-66) were ed. by H. Meissner (1929). See lives by R. Rodd, 1888; G. Freytag, 1890; and W. Richter, 1938.

Frederick V. (1596-1632), elector palatine, son of Frederick IV. He married Elizabeth, daughter of James I. of

England, 1613, and was grandfather of George I. In 1619 F. headed the Ger. Protestant Union (Calvinists), and accepted the crown of Bohemia. F.'s general was utterly defeated by the Imperialists at the battle on the White Hill (near Prague), 1620, and he lost his hereditary possessions as well as Bohemia, and was obliged to go into exile. The electoral dignity was conferred on Maximilian of Bavaria, his cousin, the Catholic leader, 1623. F. was father of Prince Rupert. See A. Gindely, *Geschichte des dreissigjährigen Krieges*, 1869-80; J. Grossé, *Friedrich von der Pfalz*, 1870; and R. Krasenig, *Der Winterkönig*, 1881.

Frederick I. (c. 1471-1533), king of Denmark and Norway 1523-33. He succeeded his nephew Christian II., who was dethroned. He was joint ruler of the duchies of Slesvig and Holstein, with his brother John. He was an able ruler and granted many privileges to the nobility and the farmers. During his reign, the Lutheran faith spread to his dominions.

Frederick II. (1534-88), son of Christian III., and king of Denmark and Norway. His reign falls into two distinct periods—that of war, 1559-70; that of peace, 1570-88. The war with Sweden lasted seven years, ending in the triumph of F. at the peace of Stettin. Denmark-Norway had become a great sea power and at the entrance to the Baltic F. built Kronborg, the castle which Shakespeare made famous in his play *Hamlet, Prince of Denmark*. F. possessed the gift of discovering and employing great men, and no other Danish king was ever so beloved by his people.

Frederick III. (1609-70), king of Denmark and Norway, son of Christian IV., becoming archbishop of Bremen, 1634. He succeeded to the throne in 1618. Hoping to regain ter. lost by the treaty of Bromsberg, 1615, F. and his senate declared war on Charles X. of Sweden, 1657. But Charles invaded Jutland and besieged Copenhagen, forcing the Dan. people to sign the unfavourable treaty of Roskilde, 1658. Hostilities were soon resumed, but F., aided by Brandenburg, expelled the Swedes from Jutland, forcing Charles to raise the siege of Copenhagen, 1659. A peace favourable to Sweden was concluded, 1660. The monarchy was made hereditary and absolute, instead of elective and limited, by a voluntary act of commons and clergy at a diet, 1660-61.

Frederick IV. (1671-1730), king of Denmark, from 1699, son of Christian V. He allied with Peter the Great and Augustus II., king of Poland, in 1700, against Charles XII. of Sweden, but was forced to sign the peace of Travendal on the latter's siege of Copenhagen. During the reverses of Charles in 1709, F. again made war, capturing Stralsund and Tönning. Charles was killed at the siege of Frederikshald in Norway, 1718. In 1720 F. concluded the treaty of Frederiksborg with Sweden.

Frederick V. (1723-66), king of Denmark. He succeeded his father, Christian VI., in 1746, and married a daughter of

George II. of England. A wise and able ruler, he did much to promote commerce, industry, and science. F. sent Niebuhr and others on a scientific expedition to Egypt and Arabia, 1761.

Frederick VI. (1768-1839), king of Denmark and Norway, son of Christian VII., assumed the regency in 1784, owing to his father's insanity, until he ascended the throne in 1808. His rule was marked by many reforms, including the abolition of serfdom in Denmark and Schleswig-Holstein. F.'s chief minister was Bernstorff. In 1800 Denmark joined the armed neutrality of the N. against England. This caused hostilities with the Brit., and F. allied with Napoleon in 1808. In 1814 Norway was taken by the allies from Denmark and given to Sweden under Bernadotte. See —, *Giesling, Zur Regierungsgeschichte Friedrichs VI.*, 1851-1852.

Frederick VII. (1808-63), king of Denmark, son of Christian VIII., whom he succeeded in 1848. The chief events of his reign were the wars arising out of the revolt of the Slesvig-Holstein duchies against a common constitution with the kingdom of Denmark and the separation of Slesvig from Holstein. In 1849 F. signed the democratic constitution which has been the basis of political life ever since.

Frederick VIII. (1813-1912), king of Denmark, son of Christian IX., succeeded his father in 1906. He married Princess Louise of Sweden in 1869, and his eldest son, Christian, was b. in 1870. His second son, Charles, became king of Norway in 1905, under the title of Haakon VII. F. worked for the creation of a common policy for the Scandinavian kingdoms.

Frederick IX. king of Denmark (b. 1890) succeeded his father Christian X. in 1947. He married Princess Ingrid of Sweden in 1935, and has three daughters. In 1917 he joined the Royal Dan. Navy as a rating and attained by his own efforts the rank of captain. Later he was promoted in accordance with his increasing responsibilities as crown prince, and is now, as king, commander-in-chief of his navy, as well as of his army. At eighteen F. became a member of the State Council (consisting of the king and his responsible ministers), and for several periods before, but chiefly during the Ger. occupation of Denmark, he acted as regent. He has travelled widely, having visited Iceland and Greenland, the Far East, and, with the crown princess, U.S.A. and Canada in 1939. F. is an ardent lover of music and himself an accomplished conductor, having often played with the Royal Theatre orchestra, Copenhagen.

Frederick (1676-1751), king of Sweden, third son of the Landgrave Karl of Hesse-Cassol. He entered the Eng. military service, and in the war of the Sp. Succession commanded the Hessian corps. In 1715 he entered the Swedish service, and on the resignation of her claims to the throne of Sweden of his wife, Ulrica Leonora, sister of Charles XII., he became king.

Frederick Augustus I. (1750–1827), king of Saxony, son of the elector Frederick Christian, b. at Dresden. In the Bavarian Succession war he sided with Frederick the Great against Austria, and afterwards joined the league of Ger. princes. In 1806 he joined Prussia against France, but concluded a treaty of alliance with Napoleon after the battle of Jena, and during the subsequent wars of Napoleon he was a faithful ally of the emperor. See A. Bonnefons, *Un Allié de Napoléon, Frédéric Auguste, premier roi de Saxe, 1802*.

Frederick Charles of Prussia (1828–85), nephew of the Emperor William I., known as the 'Red Prince.' He was educated at Bonn, and then entered the army, serving with distinction in the first Schleswig-Holstein war in 1848. He also took part in the Austrian war of 1866, and the Franco-Ger. war (1870–71), where his leadership was conspicuous. He gained distinction at the battles of Gravelotte, Thionville, and St. Privat.

Frederick Louis, Prince of Wales (1707–1751), eldest son of George II. and Queen Caroline. In 1736 he married Augusta, daughter of Frederick, duke of Saxe-Gotha, and had seven children, the eldest afterwards becoming George III. Frederick, who led a very gay life, was always on bad terms with his father, and, forbidden the court, became the patron of the opposition which made Leicester House its headquarters.

Frederick William (1620–89), elector of Brandenburg, known as the 'Great Elector,' and son of the elector George William, b. in Berlin. He was educated at the univ. of Leyden. On his father's death in 1640 he became ruler of Brandenburg and Prussia, and immediately set himself to repair the damage wrought during the Thirty Years war, still in progress. In 1648, by the treaty of Westphalia, the area of his dominions was largely increased, and in the course of ten years, with the help of his able generals, he had created an army of 25,000 men, organised on the Swedish model. He reorganised the univs. of Frankfort and Königsberg, and founded the univ. of Duisburg and the Royal Library at Berlin. He made the canal which still bears his name between the Oder and the Spree, and introduced a postal system. He encouraged the immigration of Huguenots who brought their culture and industries to his backward country. He greatly enlarged and beautified Berlin, leaving a large exchequer, a thoroughly well-organised army, and the beginnings of a colonial empire. His final act of statesmanship was to urge and back Wm. of Orange's Eng. expedition. He, not F. the Great, was the real founder of the Hohenzollern tradition, the Russian state, and therefore of modern Germany. See R. Tuttle, *History of Prussia, 1134–1710*, 1892; T. Carlyle, *History of Frederick the Great, 1838*; A. Waddington, *Le Grand Electeur et Louis XIV.*, 1905–8; and F. Schevill, *The Great Elector*, 1948.

Frederick William (1711–1815), duke of Brunswick. He was taken prisoner at

Lübeck after the battle of Auerstadt. Napoleon put up a veto on his accession to the dukedom at the death of his eldest brother, and in 1809 he joined Austria in the war against the emperor. At the defeat of the Austrians at Wagram he came to England, where he received an enthusiastic reception, and afterwards took part in the Peninsular war till his return, in 1813, to his dominions. After the return of Napoleon from Elba, F. W. joined the allies and fell at Quatre-Bras, June 16, 1815.

Frederick William I. (1688–1740), king of Prussia, son of Frederick I. (d. 1713), and father of Frederick the Great. He was passionately fond of military exercises, and noted for his eccentricities. Though he formed a large, well-disciplined army, he did not engage in any very important wars. In 1720 he won from Sweden the dist. of Pomerania between Rs. Oder and Peene, including Stettin, Wollin, and Usedom Is. He founded a splendid administrative system, estab. a medical college, and various useful institutions in Berlin, and left a powerful and wealthy kingdom to his son and successor. See E. de Mauvillon, *Histoire de Frédéric Guillaume I.*, 1741; F. Förster, *Geschichte Friedrich Wilhelms I.*, 1835; and H. Tuttle, *History of Prussia, 1134–1710*, 1892.

Frederick William II. (1741–97), son of Prince Augustus William of Prussia and nephew of Frederick the Great, whom he succeeded in 1763. In 1792, with Austria, he entered into a war against the Fr. republic, to uphold the royalty, which lasted till 1795, resulting in the cession to France, by the treaty of Basle (1795), of the Prussian ter. W. of the Rhine. By the partitions of Poland, in which F. W. shared, Prussia received large accessions of ter. During F. W.'s reign, owing to his indolence and lack of political sagacity, Prussia declined. He was devoted to the arts, Beethoven and Mozart enjoying his patronage, but was without mental qualities of a high order. See Stadelmann, *Preussens Könige in ihrer Tätigkeit für die Landeskultur*, vol. iii., 'Friedrich Wilhelm II.', 1883; Paulig, *Friedrich Wilhelm II., sein Privatleben und seine Regierung*, 1896; and E. Bleisch, *Der Hof Friedrich Wilhelms II. und Friedrich Wilhelm III.*, 1914.

Frederick William III. (1770–1840), son of Frederick William II., b. at Potsdam. He became king of Prussia in 1797. In 1806 he was overthrown by Napoleon at Jena and Auerstadt, and on the annihilation of the Prussian Army, the Fr. overran the kingdom. The Russian armies then advanced to the aid of Prussia, but were overthrown by Napoleon at Friedland (1807), leaving Prussia at the mercy of the conqueror. The treaty of Tilsit completed the ruin of Prussia, and during the next few years she remained almost defaced as a European power. At the beginning of 1813, however, the Ger. rose against France, and F. W. entered into an alliance with Russia and Austria, and the Allies overthrew Napoleon at the battle of Leipzig. At the Congress of Vienna,

Prussia regained her lost ter. F. W. did much to advance the material welfare of his realm, and the customs union was estab. in his reign. See H. von Petersdorff, *König Friedrich Wilhelm IV.*, 1900.

Frederick William IV. (1795-1861), king of Prussia, son of Frederick William III. He began his reign with moderate measures, but was vacillating and infirm of purpose, with a marked tendency to mysticism. There was a revolutionary outbreak in Prussia and Berlin, 1848, caused in part by the Fr. revolutionists' triumph, and Frederick was forced to grant a constitution to his people. In 1849 he declined the offer of the imperial crown by the Ger. National Assembly at Frankfort. They elected the Archduke John of Austria as lieutenant-general. His irresolution and neutrality in the Crimean war were severely censured. Owing to symptoms of insanity Frederick resigned the control of his kingdom to his brother William, 1858, and was succeeded by him as William I. in 1861. See L. von Rnuke, *Biographie Friedrich Wilhelms IV.*, 1878; H. von Petersdorff, *König Friedrich Wilhelm IV.*, 1900; F. Rachfahl, *Deutschland Friedrich Wilhelm IV. und die Berliner Marzrevolution*, 1901, and *Die deutsche Politik: König Friedrich Wilhelm IV. im Winter 1848-49*, 1919.

Frederick William Charles I. (1754-1816), king of Wurttemberg, son of Frederick Eugene, succeeded his father as duke of Wurttemberg, 1797, and king, 1806. He married an Eng. princess, Charlotte Augusta Matilda. He became elector, 1803, and by alliance with Napoleon, 1805, gained lands and the title of king. Frederick joined the Confederation of the Rhine in 1806. His army fought on Napoleon's side in 1809, 1812, and 1813, but joined the Allies in Nov. 1813, the treaty of Fulda leaving him his kingdom on this condition only. The people seized this opportunity of his weakness to re-establish their old constitution, changed by Frederick for absolutism. See E. Hölzlo, *Politische Geschichtie Württembergs, 1789-1805*, 1931.

Frederick, co. seat of F. co., Maryland, U.S.A., 41 m. W. by N. of Baltimore. It has a Jesuit institution and a college. The manufs. include canning, brush-making, tanning, and flour-milling. Pop. 15,800.

Fredericksburg, tn. of Spottsylvania co., Virginia, U.S.A., situated on the Rappahannock R., about 55 m. S.S.W. of Washington. The riv. affords great water power, the tide ascending the riv. as far as F. During the Amer. Civil war a battle was fought here, in which the union forces under Burnside were defeated by the Confederates (1862). The tn. manufs. paper, leather, machinery, and has fine wheat mills. Pop. 10,000.

Fredericton, cap. of the prov. of New Brunswick, Canada, on the St. John R. It was originally called St. Anne's Point. It is an educational centre, with the univ. of New Brunswick and a teachers' college, and there is an Anglican cathedral. It has three shoe factories, a boat and canoe factory, two woodworking factories, and

is the centro of a large dairy industry and lumber industry. The prov. parliament buildings and prov. gov. offices are also situated at F. It is served by Canadian National and Canadian Pacific railways. New Brunswick military headquarters and the Royal Canadian Mounted Police headquarters for New Brunswick are at F. Pop. 18,000.



PARLIAMENT BUILDING, FREDERICTON

Frederiksberg, residential suburb on the W. of Copenhagen, Denmark, with a military college. Pop. 98,000.

Frederiksborg, Dan. royal castle built in 1602-20, situated about 20 m. from Copenhagen, Denmark. It was destroyed by fire in 1859, and, after being restored (1864-71), was utilised as an historical museum. The canton of F. has a pop. of 115,000.

Frederikshald (Halden), seaport and garrison tn. of Norway, in Smaalenene co., on the Ido Fjord, 35 m. by rail S.E. of Christiania. Charles XII. was killed in the trenches of the fortress in 1718. There is a large export trade in timber, and marble of excellent quality is quarried. Pop. 11,000.

Frederikshavn, seaport and cap. of Jutland, in the prov. of Hjorring, Denmark, on the Cattegat, 36 m. N.E. of Aalborg. It has an excellent harbour, free from ice throughout the year. It is protected by the citadel, Fladstrand, which formerly gave its name to the tn. It has considerable trade in dairy produce. Principal exports are fish and oysters. There is a regular steamer service running to Sweden, Copenhagen, and England. Pop. 8000.

Frederikstad, seaport of Norway, in Smaalenene co., at the mouth of the Glommen, 58 m. by rail S.E. of Christiania. It exports timber, manufs., bricks, and has shipbuilding works. Pop. 15,800.

Fredeswitha, St., see Frineswide.

Fredonia: 1. Vil. of Chautauqua co., New York, U.S.A., 3 m. from Lake Erie. It

contains a normal school and the Darwin Barker public library. There are grape-vine nurseries, canneries, and patent medicine works. Pop. 5700. 2. Tn. of Colombia, in dept. Antioquia, S.E. of Medellin, with coal-mines. Pop. 11,000.

Free-alms, see FRANK-ALMOIGNE.

Freebench, Eng. law, the interest which a widow had in the copyhold lands of her late husband, so long as she remained unmarried. The amount to which she was entitled amounted in general to one-third of the lands held by her husband. Abolished by the Law of Property Act, 1927.

'Free Church of England, small sect which broke away from the Established Church in 1814, as a protest against the influence of the Tractarian or Oxford movement. It maintains the episcopal organisation, and is said to have retained the apostolic succession. It is, however, strictly Protestant in doctrine, and seeks to promote evangelical and Reformation principles. Its first church was formed at the vil. of Bridgetown in Devon by the Rev. J. Shore. Its numbers are extremely limited. Government is carried on by an annual convocation.'

Free Church of Scotland, body of Scottish Presbyterians who, at the 'Disruption' of the Church of Scotland in 1843 separated from the Established Church. It claimed, and still claims, however, to be the historical continuation of the National Church which was set up in 1560. It retains the 'Confession of Faith and the Standards of the Church of Scotland as heretofore understood,' that is to say the Westminster Confession and the Longer and Shorter Catechisms, but in 1892 the binding force of these was somewhat modified by a Declaratory Act, which classed some parts of the confession among things not to be considered as literally binding. This is quite in accordance with the Free Church Catechism issued soon after the disruption, in which the right of a church to alter its creeds and formularies without state sanction is reckoned as one of the essentials of its freedom. The disruption was caused generally by an entire difference of opinion on the whole question of estab. and the authority of the State over the Church. The proximate cause, however, was the question as to whether a minister could be forced on an unwilling congregation. It is important, however, to recognise that the leaders of the Free Church party in 1843 did not condemn all union of Church and State, but only such as infringed the Church's right of self-government, committed to her by Christ Himself, of whom the Westminster Confession declares 'the Lord Jesus as King and Head of His Church, hath thereto appointed a government in the hand of church officers, distinct from the civil magistrate.' Since the 1688 revolution, however, the union between Church and State had been such that all of these eccles. regulations had been made part of the statute law. A case had arisen in which a minister presented to a living had been rejected by the congregation, and in 1834 the General

Assembly passed the Veto Act declaring it to be a fundamental law of the Church that no pastor should be intruded on any congregation contrary to their will. In 1838, in the Auchterarder case, the court of session, however, decided in favour of the presented, and in the next year the case came before the House of Lords. Here the civil power showed but scant respect for the Church's eccles. jurisdiction, and definitely stated the supremacy of the statute law in all cases, denying in fact that it is even possible that there should be such a thing as a conflict between the civil law and the eccles. courts of an estab. church. In 1842 the General Assembly formally refused to enter on the course of action which the recognition of this principle would involve, and threatened a separation from the State. In 1843 an attempt was made to secure a parl. inquiry, but this failing, at the meeting of the General Assembly (May 18, 1843) the major part of the Assembly made their protest and quitted St. Andrew's church. They proceeded to Tansfield Hall, Canonmills, and there was held the first Free Church Assembly, with Dr. Thomas Chalmers in the chair. By May 23, 474 ministers had resigned their benefices, homes, and incomes, and trusted themselves entirely to voluntary support. The financial system was organised quickly and most successfully, and a central sustentation fund furnished a reasonable income for all ministers. A committee was formed in 1863 to consider the proposal of alliance with the United Presbyterians, but the refusal of the Free Church to give an unqualified condemnation of estab. made it impossible. The proposals, however, were continually renewed, and on Oct. 31, 1900, union between the two was finally completed at Edinburgh, the newly formed body bearing the title of the United Free Church. A small body refused to accept this union, and claimed to be the continuation of the old Free Church. It, therefore, claimed the possession of all its emoluments, and the House of Lords decided in favour of the small body. The impossible nature of the decision was immediately apparent and an Act of Parliament in 1905 altered this position. A div. of the property, etc., between the two bodies was made by a Royal Commission. To-day the F. C. of S. is quite a small body, strongest in the highlands and commonly known as 'Wee Frees.' The union of the Church of Scotland with the United Free Church of Scotland was effected at a joint meeting of the General Assemblies of both Churches on Oct. 2, 1929. Prior to this union of 1929, Scotland was divided into sixteen synods and sixty-six presbyteries. There have since been added the presbyteries of the synod of England and the presbyteries of N. Europe, S. Europe, Spain, and Portugal, and a number of Indian and colonial presbyteries, making a total of eighty-six. The number of communicants on the roll (Dec. 31, 1928) was (prior to the union of the Churches) 759,797. The supreme court is the General Assembly, which meets annually,

In May, synchronously with the meeting of the General Assembly of the Established Church and of the remnant Free Church of Scotland. See also SCOTLAND, CHURCH OF. See C. G. MacCrie, *Church of Scotland, Divisions and Reunions, 1901*; W. L. Mathieson, *Church and Reform in Scotland, 1916*.

Free Churches, general name given to all those Protestant Christian bodies of England and Wales which are not established by the State. They include not only the large group which forms the Free Church Federation, but also many others not thus associated. The point in common between all these bodies is implied in the title. All hold that permanent union between Church and State is impossible, since it leads to the State imposing laws on the Church, and that, therefore, the two should exist separate, the Church being free to make its own rules and carry on its own system of government in matters spiritual. Most of the F. C. are democratic in form, and the governing body has the power of changing the conditions of membership, deciding on corporate expressions of faith, etc.

Freedom of a City, see BURGERS and FREEMAN.

Freedom of Speech. See PARLIAMENT—HOUSE OF LORDS, HOUSE OF COMMONS: Composition, Officers, and Privileges.

Freedom of the Press, see PRESS, FREEDOM OF THE.

Freehold. A F. estate or interest in land may be strictly defined as an interest which may continue for the period of some particular life or lives, whether limited to the duration of some person's life, or of some uncertain period included in such life, as, for example, to continuing widowhood, or until bankruptcy. The term necessarily comprises the larger interest, fee simple and fee tail estates or estates of inheritance, and indeed F.s. are frequently divided into those of inheritance and not of inheritance, the latter being F.s. for life. The term F. (*liberum tenementum*) comes from feudal times, and meant that the tenant held his land by some small services of an honourable as opposed to a base or servile kind. Such services are now long since abolished, and the only feudal incidents of a F. still surviving, or nominally surviving, are (1) escheat or devolution to the Crown on intestacy, there being no heirs; (2) an oath of fealty, never exacted; (3) relief, or a year's rent to the feudal overlord (if there is one) on succession to the deceased tenant; (4) a small chief or quit-rent. There were also other F.s. of an extraordinary or more localised kind, viz. grand serjeantry (*g.v.*), petty serjeantry (*g.v.*), burgage tenures (*g.v.*), gavelkind (*g.v.*), and frank-almoign or tenure by spiritual services, such as saying prayers for the parishioners, which were abolished in 1925. The learning in F.s. is for the most part academic, and at the present day it may be said to be mainly regarded as merely the direct antithesis of a leasehold interest, a F. being necessarily an estate for a certain period of uncertain duration, while a leasehold interest is

no more than one for a fixed term of years. The third principal form of landholding was that of copyhold tenure, which in its origin was a holding by villeins of a lord of a manor; but which in its later development became largely assimilated to F., and might on certain payments be compulsorily *enfranchised* (i.e. turned into a F.). All these old forms of tenure, however, disappeared with the passing of the Law of Property Act, 1927. See also COPYHOLD; ENTAIL; ESTATE, etc.

Free Imperial Cities. The Freie Reichsstädte of Germany were those mediæval towns which enjoyed either complete or partial autonomy. They may in their constitution be compared to the chartered towns of medieval England, the free towns of Spain (see FUEROS), and the It. republican cities of the same period. In all or most of these cases the anomaly of such an *imperium in imperio* was due to the wealth and influence early acquired by towns through industry and commercial relations and consolidated by defensive leagues like the celebrated confederacy of the Hanseatic League. The number of F. I. C. varied from time to time by reason of the struggle to maintain their privileges in the teeth of ecclesiastical and secular opposition and royal jealousy. Mainz, the head of the Rhine confederated towns, became transferred to the episcopal see in the middle of the fifteenth century, while Chemnitz and certain other towns of that league were subsequently taken by the dukes of Saxony. Others were shorn of their privileges by successive emperors, and yet others were conquered by foreign enemies. At the end of the eighteenth century they numbered about fifty, divided into two benches, the Rhinish and Swabian, as two integral members of the Diet. At the beginning of the nineteenth century only six possessed any measure of independence, some having been assigned to France while the rest were deprived of privileges of which they had long since ceased to retain anything but the shadow. By the terms of the Ger. confederation only Hamburg, Lübeck, Bremen, and Frankfurt were recognised as F. I. C., but the privileges which the first three long preserved were, in later times, of no greater importance than those of various boroughs in England. See *The German Free Cities (1914)*.

Free-lances, roving companies of knights and men-at-arms, who wandered about to different states selling their services to any lord who was anxious for aid in the constant feuds of the Middle Ages. They became most famous in Italy as *condottieri*. In Germany they were represented by the *Landsknechte* (land-troopers), mercenary foot-soldiers raised by Maximilian I. in 1487. *Landsknechte* were the men of the Austrian lands as opposed to the Swiss mountainers, but are commonly confused with *Luzknechte* (lance-troopers). They won fame in the fifteenth and sixteenth centuries' wars, but after the Thirty Years war fell into disrepute. The term is now applied in general to all who own no fixed

party allegiance, or follow the methods of no particular school, but act independently (and sometimes capriciously).

Freeland, tn. of Luzerne co., Pennsylvania, U.S.A., 28 m. S.W. of Scranton. In the vicinity there are coal and anthracite mines. The bor. has breweries, silk mills, and foundries. Pop. 6,500.

Free Libraries, development of comparatively recent times, though the first was estab. by Chatham in Manchester, England, 1653. The modern library movement started in 1876 with the foundation of the Amer. Library Association. The name of Carnegie must always be associated with the growth of public libraries. He contributed enormous sums yearly for their foundation and this work is continued by the trusts which he founded. The tax-supported free public library ('municipal' or 'endowed') is ousting the circulating, subscription, and proprietary libraries. Free access to open shelves is now allowed in many libraries, and not only the reference but also the lending depts. are mostly free of charge. See also LIBRARIES. See T. Greenwood, *Free Public Libraries*, 1890; J. Ogle, *The Free Library*, 1897; L. R. McColvin, *The Public Library System of Great Britain*, 1942; and ... A. Aspinwall, *Modern Public Libraries*, 1946.

Free Lovers, see BIBLE COMMUNISTS and PERFECTIONISTS.

Freeman, Edward Augustus (1823-92), historian educated at Trinity College, Oxford. While at the univ. he began to devote himself to the study of hist. and architecture. His first books were *A History of Architecture* (1849), *An Essay on the Origin and Development of Window Tracery in England* (1850), and (with W. B. Jones) *History and Antiquities of St. David's* (1856). In the last year he pub. also *The History and Conquests of the Saracens*, his first contribution to hist. Some further books followed, and then came *The History of the Norman Conquest of England, its Causes and its Results* (1867-76), his most outstanding achievement. He wrote many other works, but it is as the historian of the Norman Conquest that he will be best remembered. While lacking the charm and the literary eloquence of Froude, he has the advantage over his contemporary of being thoroughly reliable and of following the authorities upon which he based his conclusions. He was regius prof. of modern hist. at Oxford from 1884 until his death. See W. R. W. Stephens, *The Life and Letters of E. A. Freeman* (with bibliography), 1893.

Freeman, one who possesses the freedom of a city, bor., or company. Prior to the Municipal Corporations Act, 1835, bor. freedom was regulated by the bor. charter. An admitted F. enjoyed many rights and privileges which varied in different ports. *Inter alia*, a F. generally had the parl. vote, immunity from co-jurisdiction, exemption from tolls, and a share in the revenue accruing from the corporate property. The Act of 1835 does not affect the rights of their admitted F., and the following are still entitled to be

admitted F. and to enjoy the above noted rights except exemption from tolls: bor. inhab.; wife, widow, son, daughter, son-in-law, of a F.; apprentices to F.; and those who before the Act would have been entitled to be admitted, otherwise than by gift and purchase, the two latter modes of admission being now abolished. Bor. councils may also admit persons of distinction or persons who have performed eminent services for the bor. to be honorary freemen. Freedom of a city is tantamount to that of a bor., the distinction between a city and bor. being merely eccles. Freedom of the London livery companies is a survival of the guild-merchant system. There are four ways of acquiring the freedom of a company: (a) apprenticeship to a F. either of the company or of the City of London; (b) patrimony, i.e. by reason of being the child of an admitted F.; (c) gift (honorary); (d) redemption or purchase, usually limited to members of the guild trade.

Freeman-Thomas, **Freeman**, see WILTON, VISCOUNT.

Freemasonry, system observed by the secret associations of 'free and accepted masons.' Much ill-founded yet interesting conjecture has ever surrounded the theories concerning the origin of F., and no point of time in antiquity seems too remote for its genesis in the eyes of its more enthusiastic friends. Some trace it to the time of the erection of the Tower of Babel, others to that of Solomon's Temple. In a work entitled *Origin and Antiquity of Freemasonry* (1898) Albert Churchward endeavoured, with the aid of numerous cabalistic diagrams of a geometrical character and pictorial representations from a papyrus of Ani of Maat and Osiris seated on a Masonic square, to show the analogy of F. 'to the eschatology of the anc. Egyptians, as witnessed by the *Book of the Dead* and the Great Pyramid of Ghizeh, the first Masonic temple in the world.' Dr. le Plongeon attempted to trace the origin of F. back to the sacred mysteries among the Mayas and Quiches 11,500 years ago, from data gathered from excavations in Yucatan in Mexico. More modest computations go no further than to place the introduction of F. into England in the seventh century, and the foundation of the Grand Lodge at York in A.D. 926. Others allege that F. came into existence at the time of the crusades, but in view of the almost atheistical character attaching to the freedom of Masonic religious conceptions, this seems improbable. But the most unbiased historians seem to concur in relating its origin to the purely utilitarian association of fellow craftsmen in a masters' guild or trade union. There is some warrant for this genealogy, because the art of Gothic architecture and its allegorical meaning were in no small degree in possession of the stone-cutters who were employed by the abbots in eccles. buildings and repairs. The secret signs used by itinerant masons were devised for the purpose of mutual recognition of each other as experts in

their art and not mere impostors. Moreover, the twelfth century affords something like proof of the existence of an association of Bauhütten (literally 'wooden huts' of masons or stonemasons) in various parts of Germany, bound together by common craft laws and trade customs, and acknowledging a common ceremonial and set of symbolic forms.

Whatever the origin of F., there is clear enough evidence that modern F. in England dates from the foundation of the Grand Lodge of England in 1717; that of Ireland being founded in 1730, and Scotland in 1736. But what particular processes were at work in the transition of 'operative' to modern or 'speculative' F. it is hard to say. The traditions of F. seem to warrant the assumption that in spite of the fact that medieval or operative freemasons were usually engaged in erecting or repairing church buildings, they had no marked reverence for the church doctrine, and that though the church was at first disposed to extend its favour to the association, it eventually grew hostile to it and supported the ineffective prohibition of F. enacted by the statute of 3 Henry VI. (1424). It is possible that freemasons, no less than other men, were affected by the spirit of the Reformation and the speculations of Bacon on the possibilities of natural laws in the satisfaction of human needs. Be the psychological connection what it may, F. received a fresh impulse towards the latter part of the seventeenth century, when a general assembly of masons resolved to extend Masonic privileges to other than operative masons, to adopt ancient symbols of fraternity, and, generally to revive the system of F. The antiquary Elias Ashmole is credited with being the first amateur or speculative member 'accepted' (1646), and the name of James Anderson, a Scottish minister, is commonly associated with the work of revival. The constitution of one grand lodge, composed of provincial or other smaller lodges, presided over by a grand master, dates from 1717 (*see above*), and it is from this time, too, that the prerogative of creating new lodges was vested in the grand master. Later, provincial grand masters were appointed, and the purpose of speculative F. tended more and more to become purely benevolent. Still later, the requirement in members of a knowledge of ordinary masonry was dropped, although even now the association, when laying foundation stones, does so with full masonic honours. Its members as a whole profess benevolence and charity rather than architectural or stonemasonry skill. 'The principles and tenets of our crafts,' says Churhward, 'are the highest principles of morality, charity, truth, and justice, which we have received as a sacred legacy from our forefathers, teaching us by sign and symbol those duties we owe to others and ourselves.'

F. is less popular on the Continent than in Great Britain. The pope issued a bull excommunicating freemasons in 1738, and F. was one of the errors condemned by

the syllabus of 1864. In France, however, F. was from its very inception early in the eighteenth century strongly favoured by the nobility, in spite of imperial censure and papal bulls. Notable Fr. masonic orders of the eighteenth and early nineteenth centuries were La Félicité, La Grande Loge Anglaise de France and La Grande Loge Nationale (afterwards the Grand Orient), and the Suprême Conseil; one at least of which was nothing more than a Jacobite combination. It is said that the general atmosphere of Fr. F. was low, and colour is given to this assumption by the fact that admission to membership could be purchased without any inquiry into character. Later, Fr. F. became infected with mysticism and the most grotesque 'degrees'. In France, as in Italy, Hungary, and elsewhere on the Continent, there was a strong tendency for F. to become involved in politics and, thereby, to incur the hostility of the state. For this reason, relations between Brit. and Fr. freemasons were never close. Prior to the First World War, the Grand Orient had some 300 lodges; but owing to their political activities, and still more on account of the exclusion from their rules of the familiar reference to the Great Architect of the Universe, the regular grand lodges later seceded from the Grand Orient, and in 1914 there came into existence a new body which styled itself the Grande Loge Nationale indépendante et régulière. In Italy, F. was dissolved by Fascist decree (*see also ITALY*). In Germany the advance of F. was furthered by the brilliant intellectual support of such men as Lessing, Herder, Fichte, and Goethe, but disappeared under the Nazi regime.

F. was introduced into the U.S.A. in 1730, when a delegation from the Grand Lodge of England appointed Daniel Cox Provincial Grand Master for Pennsylvania, New York, and New Jersey. In the U.S.A. masonry has flourished. The last official figures showed there were about fifty independent Grand Lodges in the U.S.A. having 16,600 constituent lodges on their rolls, with a total membership of 3,927,000. The total membership for Canada is over 200,000. The Amer. Grand Lodges are in full affiliation with all other Grand Lodges except those under the jurisdiction of the Grand Orient of France.

F. received a great increase in membership during and immediately after the First World War. Between 1914 and 1930 the total world membership increased approximately by 100 per cent. While it is difficult to ascertain the exact numerical strength of F., authorities put it down at round about 4,400,000, with particular strength in those parts of the globe inhabited by the Eng.-speaking races. Within the craft there has been a marked tendency of late to take a much greater interest than hitherto in the intellectual side of the subject: numerous study circles have been formed in the lodges and lectures have become increasingly popular.

See G. Oliver, Institutes of Masonic Jurisprudence, 1859; G. Findel, History of

Freemasonry (trans.), 1866; A. Churchward, *Origin and Evolution of Freemasonry*, 1920; R. F. Gould, *The Concise History of Freemasonry*, 1920; W. Willmington, *The Meaning of Masonry*, 1922, and *The Masonic Initiation*, 1924; M. Johnson, *Beginnings of Freemasonry in America*, 1924; F. de P. Castells, *English Freemasonry, 1600-1700*, 1931; and A. Robbins, *English-speaking Freemasonry*, 1936.

Freeport, co. seat of Stephenson co., Illinois, U.S.A., on the Peoria R., 100 m. N.W. of Chicago. There are numerous manufs.—machinery, carriages, shoes, etc.—large railway shops, and dairies. A granite boulder commemorates the famous debate between Lincoln and Douglas, in which the latter maintained the so-called ‘Freeport doctrine’ on slavery. Pop. 22,306.

Free Port (It. *porto franco*), harbour where ships of all nations may enter and load and unload by paying a moderate and uniform toll. F. P.’s. facilitate transit trade, and form a kind of foreign dist. within a state. They are employed as depots, where goods are first stored free of custom duty; and then the goods may be either re-shipped for export (on payment of transit duty), or admitted for home consu. pti. ... when, of course, the usual full customs of the country have to be paid. F. P.’s. have been estab. at Hong-Kong, Singapore, Copenhagen, and New-Orleans; and the coaling stations of Gibraltar, St. Helena, and Aden are nominally F. P.’s., though not absolutely so.

Free Reed, see under *REED*.

Free Soil Party, The, name given to a political anti-slavery party in U.S.A., formed in 1848, which lasted till 1855, and then became one with the Republican party. It was originated by a union of the anti-slavery Whigs and Democrats with the Barnburners (q.v.). It nominated Van Buren for the presidency, but he was defeated in 1848. It was really a combination of the political abolitionists, many of whom had been formerly identified with the more Radical Democratic party, the anti-slavery Whigs, and a faction of the Democratic party in the state of New York.

Free State, see *MARYLAND*.

Freestone, building stone that is granular in structure and can be split readily in any direction. The name appears to have reference to this even quality. Stones used as F.s. are usually sandstones or limestones. Though fairly compact in structure, they are free from irregularities, and there is no distinct cleavage. They may be quarried in large blocks, and dressed or carved in any fashion without risk of breakage. The F.s. of the N. of England are usually sandstones; those of the S. and W. are limestones. The limestones are called oolitic because the granules of which they are composed are egg-shaped.

Freethinkers, term used of all who reject belief in divine revelation, applied especially to the deistical writers of the seventeenth and eighteenth centuries in England. The name was accepted by the rationalists as expressing persons who

thought freely for themselves on all questions, including eccles. and theological subjects. See also *DEISM*. See G. Lechner, *Geschichte des Englischen Deismus*, 1841; and A. S. Farrar, *Critical History of Free Thought*, 1862.

Freetown, cap. of Brit. Sierra Leone, W. Africa, situated at the mouth of the Sierra Leone R., near the coast. It has a fine harbour protected by fortifications and is a Brit. coaling station. It contains wharves, gov. offices, barracks, the governor’s residence, a cathedral, supreme court, a technical school, and Fourah Bay College. The chief exports are indiarubber, palm oil, resins, hides, and gold and silver filigree work which is made by the natives. The tn. is divided into two prin. parts, the negroes inhabiting one quarter, and the better part of the tn. being in the possession of the Europeans, immigrants, etc. Since the marshes have been drained F. is much healthier, and there have been few cases of yellow fever since the introduction of a piped water-supply more than twenty years ago. F. has a mean ann. rainfall of 174 in.

In 1893 the management of F. was put into the hands of a council of fifteen members, twelve of whom were elected by the people, and three appointed by the governor of Sierra Leone. The council elected a mayor from its members. The African pop. therefore controlled the government of the tn., but in 1926 the municipality had to be dissolved following a series of financial scandals; the ensuing commission of inquiry found that the council had no practical knowledge of the implications of satisfactory municipal services, and no standard of comparison by which to measure the success of their activities. It was replaced by a tn. council, with an official majority. There exists in F. a system of tribal control by headmen, whose authority over tribal groups living in the tn. is recognised by the governor. Until 1932 the headmen were empowered to make rules respecting indebtedness, poor relief, and education, subject to the approval of the governor and the tn. council, but to-day they retain only police powers, such as reporting births and deaths, and new arrivals. Pop. 60,000.

Free Trade, economic doctrine which advocates equality of treatment of all commodities for the purposes of taxation, irrespective of whether they are produced at home or abroad. Taxes levied on commodities purely for revenue purposes, without differentiation between the home produce and imported goods, are no violation of this doctrine. F. T. was first advocated by Adam Smith in his *Wealth of Nations* (1776). As the national wealth increases by allowing each individual freely to engage in that occupation most fitted to his capacity, and to exchange his product in order to procure whatever other commodities he requires, so the general prosperity of the world would be enhanced by each nation devoting itself to those branches of industry specially suited to it, and exchanging its commodities, without hindrance, with other

nations. The question of trade is, however, regarded from a national and not from a universal standpoint, and though it is seldom denied that universal F. T. would be advantageous, it is frequently upheld that from a national point of view the protection of home industries is highly necessary. Free traders assert that under F. T. articles are bought at the cheapest prices and therefore produced in the most economical way, involving saving of labour and capital. Moreover, as a country pays for its imports by its exports, to allow free importation is also to encourage corresponding production along other lines. Again, competition, by bringing the home producer into contact with foreign rivals, stimulates his commercial zeal and forces him to adopt every improvement of process. As a negative argument, it is urged that even though protection might theoretically be defensible, govs. are not sufficiently wise to apply it beneficially. The fact that protected countries have generally found it necessary to impose a constantly increasing tariff against foreign goods is held to prove that such tariffs do not act effectively. The argument for protection is necessarily urged from a national point of view. It is alleged that a system of protection renders possible the carrying on of those branches of industry which are crushed by foreign competition, thereby affording greater openings for home capital and labour, and also provides a means of raising revenue. These two claims are necessarily, to some extent, antagonistic, as the revenue would diminish in proportion to the cessation of foreign competition. It is also frequently stated that although F. T. is advantageous as a normal condition of industry, nevertheless, in certain circumstances, protection is justifiable. Thus, in a new country, protection is held to foster rising industries. Where a country possesses but a limited stock of a valuable commodity, an export duty is advocated as a means of preventing its too rapid exhaustion. The contention is also made that a country which allows free imports is at a disadvantage in dealing with a country which does not do so. Hence the policy of retaliation, which has for its object the imposition of duties upon the goods of a certain country in order to force that country either to abolish or to reduce an unfavourable tariff. The dependence of Great Britain on foreign countries for its food supplies, which would prove prejudicial in case of war, and was demonstrated with unpleasant clearness in the First World War (and again in the Second World War), was held to be a reason for endeavouring to stimulate home food production by means of a duty. Great Britain held to the system of F. T. from 1860 until 1932. A campaign was started in 1903 by Joseph Chamberlain, then colonial secretary, for the institution of a system of Imperial preference (q.v.), based on the necessity of preventing the alleged decline of Brit. trade, and at the same time uniting the colonies more closely to the motherland by mutual commercial

interests. The latter part of the scheme involved the imposition of food taxes, which proved to be the least favoured part of the programme. The scheme was, however, accepted by the larger portion of the Unionist party, and gave rise to the fiscal controversy that animated Brit. political life from that date. The emergencies of the First World War necessitated a modification of Brit. F. T. policy, and in 1915 Mr. McKenna (*q.v.*) imposed duties upon certain imported articles (including motor cars, cinema films, clocks, musical instruments, plate-glass sheets) in order to restrict demands made upon cargo space in vessels needed primarily for the transport of food. In 1917 the gov. agreed to a scheme of 'Imperial Preference within the Empire,' with special reference to 'Key Industries.' In 1921 a rebate of duty on empire goods was granted. In the same year the Safeguarding of Industries Act (*q.v.*) was passed. The return of the Conservative party to power in 1924 saw a mild system of imperial preferences, notably in favour of empire sugar, dried fruits, tobacco, and wine. The McKenna duties were abolished by the Labour Gov. of 1924, but the succeeding Protectionist Gov. reimposed them for a period of five years. In 1926 the duties on foreign cereals were extended to commercial cars, and a duty was levied on imported artificial and natural silk. Light duties were also imposed on imported gas mantles, cutlery, and a few other articles. After the First World War protection was carried to great lengths in every country, with the result that Britain was placed at a considerable disadvantage. Finally, in 1932, Britain abandoned her time-honoured F. T. policy and adopted a medium-high protective tariff, food, however, being for the most part only lightly taxed, or allowed to enter free. But until the Second World War Britain's fiscal policy remained essentially liberal, and even the much criticised Ottawa agreements involved only a low tariff system. Other pre-1914 F. T. countries were Belgium, the Netherlands, and the Scandinavian countries, all of which subsequently adopted moderate protective tariffs. Some reciprocal and mutually advantageous arrangements, directed to the substantial reduction of tariffs and other barriers to trade and the elimination of discriminatory treatment in international commerce, were made in the General Agreement on Tariffs and Trade concluded, after protracted negotiations, at Geneva (Nov. 17, 1947). The schedule to this agreement shows that, in spite of these relaxations, this is far from being a free-trade world; and the wide variation in the amount of protection afforded to different commodities is itself an indication that the duties reflected the fears and pressure of local producing interests. At the conference which resulted in this agreement the U.S.A., occupying the position that Britain occupied at the time of the industrial revolution as the world's workshop, was primarily concerned to push the idea of free trade and tariff reductions. Britain, on the other hand, having lost the mono-

poly of manufactured goods and the economic leadership is chiefly concerned to get a fair deal for her export trade; for if other countries are going to build up tariffs in order to keep Brit. exports out Britain must protect her home market. The U.S.A., on the other hand, emerging from the Second World War with an enormous industrial output far beyond domestic needs, were so far ahead of every other nation in their exportable surplus that they were anxious that tariffs everywhere should be cut down—including even Brit. imperial preferences (though in the result 75 per cent of these latter were unaffected). The U.S.A. in fact wished that exports and imports should be completely free and untrammelled. Britain, moreover, owing to its peculiar dependence after the war on a flourishing export trade, stood to gain exceptionally from a revival of multilateral trading conditions and so new interest was awakened in a free trade policy, or, at all events, in one involving lower tariffs; but, owing to currency difficulties, it is necessary for Britain to supplement or qualify to some extent these multilateral or freer trading conditions by organising special bilateral arrangements. See also ECONOMICS; PROTECTION.

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Free Verse is considered by Robert Graves to be prose poetry broken up into convenient lengths, but with this many of his contemporaries disagree. Milton, in *Samson Agonistes*, achieved a form of Eng. F. V., although strictly he attempted to write Eng. poetry according to Gk. metrical laws. *Vers Libre* was practised in France in the eighteenth century by La Fontaine, and in a different form in 1890 by the Symbolists. Walt Whitman invented his own F. V. measure, which contemporary poets do not claim to have used. It was before the First World War that F. V. began to be practised extensively. Poets who used it considerably were those who were known as the Imagists, and included Ezra Pound, H. D. (Hilda Doolittle), F. S. Flint, Amy Lowell, D. H. Lawrence, T. S. Eliot, and Richard Aldington. These poets believed F. V. to apply to poetry written in rhythms more marked and definite than prose, but not so violently accentuated as those used in regular verse, and felt that the

individuality of a poet could often be expressed better in F. V. than in the more conventional forms of poetry. The movement in favour of F. V. has now spread over Europe and N. and S. America. Quotations from Ezra Pound illustrate the method and attitude of a F. V. poet.

Go, my songs, seek your praise from the young and from the intolerant,
Move among the lovers of perfection alone.

Seek ever to stand in the hard Sophoclean light
And take your wounds from it gladly:

and also:

Go, little naked and impudent songs,
Go with a light foot!
(Or with two light feet, if it please you!)
Go and dance shamelessly!
Go with impudent frolic.

Free Will, the question whether man is morally a free agent or a being whose actions are predetermined by past events beyond his control has always been one of the chief problems of philosophy. Descartes and Leibniz asserted the absence of contingency in human conduct, while Kant excepted the spiritual realm from the necessity which he observed in the material world. Later nineteenth-century philosophy, under the impulse of physical science, tended to deny human F. W., but at present it is in greater favour, albeit within a restricted field. St. Augustine laid down the principle of F. W. as a fundamental belief of the Christian Church. The doctrine of absolute prede'ination, however, advanced by Luther and Calvin, exercised a powerful influence on Protestantism at the time of the Reformation. See also under DETERMINISM and WILL.

Freezing, change from a liquid to a solid state. This is effected by cooling the liquid to a definite point of temp., which is invariable for the same substance under similar conditions of pressure. So well is this recognised that the freezing-point of water is one of the standard thermometric points, the other being the boiling-point of water. In the centigrade and Réaumur scales the freezing point of water is 0°, in the Fahrenheit scale it is 32°. The temp. at which a solid melts is theoretically the same as that at which the liquid form solidifies, therefore freezing-point and melting point are interconvertible terms. In practice, however, it is often possible to supercool a liquid, i.e. cool it to below the melting-point without freezing it. After a liquid has been brought down to its freezing-point by abstraction of heat, still further abstraction of heat must occur before it can assume the solid form. The amount of heat which is thus absorbed without change of temp. is called the latent heat of fusion. When a substance solidifies to an amorphous solid, the process of transformation is a gradual one; that is, the liquid gets more and more viscous, until it becomes solid throughout. When a substance solidifies to a crystalline state the change is sudden and solid, and liquid portions remain in contact; this is

the case with water. Some substances, after contracting through a long range of decreasing temp., expand just before the freezing-point is reached. Water behaves in this way; hence ice is lighter than water, and the effect of pressure on the liquid is to lower the freezing-point, as expansion is thereby retarded. The addition of an impurity, as salt or sugar, to water also lowers the freezing-point. When any portion of the water solidifies, the substance dissolved is separated out, and dissolves in the portion still liquid. This process absorbs heat, so that solidification is hindered. The liquid portion gradually becomes more concentrated until it is saturated, after which the salt or sugar appears in the solid mass. It is not, however, in solution, but is in the form of small crystals embedded in the mass of ice.

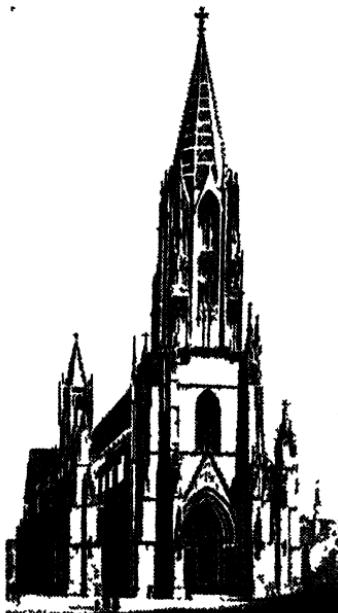
Freezing Mixtures, mixtures of substances which have an affinity for each other, such that heat is absorbed by their combination or solution. The commonest F. M. is ice and salt. The lowering of the temp. is caused by the affinity of salt and water; a solution is formed, both ice and salt being transformed into the liquid state, heat being abstracted from the mixture and surrounding objects to effect this. As long as there is still a supply of ice and salt, the process of solution goes on until a definite limit of temp. (-23 C.) is reached, at which limit the two substances become solid together, forming a *cryohydrate*. Other F. M. are: powdered sodium sulphate, or ammonium nitrate with water, temp. -15°; sodium sulphate, eight parts, hydrochloric acid, five parts, temp. -17°; sodium phosphate, nine parts, dilute nitric acid, four parts, temp. -29°; crystalline calcium chloride, ten parts, snow or powdered ice, seven parts, temp. -55°. A mixture of solid carbon dioxide and ether is a valuable F. M., while solid carbon dioxide itself ('dry snow') is used in the ice-cream and engineering industries. For very low temps., liquid oxygen, or even liquid hydrogen, may be used.

Fregenal de la Sierra, tn. of Spain, in the prov. of Badajoz. It is situated in a fertile valley and is well laid out with good streets. Its old castle was erected by the Templars. An ann. cattle fair is held here. The industries are woollen and balze manuf. and flour mills. Pop. 10,000.

Freiberg: 1. Tn. in Saxony, Germany, on the R. Mühlbach, on the N. slope of the Erzgebirge, and 19 m. S.W. of Dresden by rail. Before the Second World War it was the seat of the administration of mines throughout the kingdom of Saxony and had a famous mining academy, formed in 1765. There were also large smelting works and foundries. F. had extensive manufs. of gold and silver, lace, woollen, linen, and cotton goods, iron, copper, and brass wares, gunpowder and white lead. It has many fine old buildings, one of the most interesting of which is the cathedral: the S. portal, or 'Golden Gate,' is a fine example of medieval Ger. art. It has a large organ built in 1714 by Gottfried Silbermann (1683-1753). Adjoin-

ing the cathedral (1484, restored 1893) is a mausoleum containing the burial vaults of the electors of Saxony from 1594 to 1694. In the neighbourhood are found gold, silver, and lead zinc, bismuth, nickel, cobalt, and arsenic. The tn. was occupied by Russian forces in April 1945. Pop. 36,400. 2. (Czech Příbor). Tn. in Moravia, Czechoslovakia, situated 40 m. E.N.E. of Olomouc. Pop. 4000.

Freiburg (Switzerland), see FRIBOURG.



FRIBURG CATHEDRAL

Freiburg-im-Breisgau, city and archiepiscopal see of Germany, in Baden, 40 m. N.E. of Basel, on the Dreisam, at the foot of the Black Forest range. It possesses a famous univ. founded in 1157 and attended by 2000 students. The cathedral is one of the most perfect specimens of Gothic architecture in Germany, cruciform in shape and built of red sandstone, and probably dates from between 1122 and 1252; the tower, 386 ft. high, is one of the finest in Europe. Among the other buildings are the palaces of the former grand duke and archbishop, the *Kaufhaus*, and the old tn. hall. The manufxs. include surgical and musical instruments, buttons, chemicals, starch, leather, silk thread, and paper. Since 1821 it has been the seat of a Rom. Catholic archbishop. F. became a free tn. in 1120; it fell twice into the hands of France (1677-97 and 1744-48), played an important part in the Thirty Years war, and finally passed to

Baden in 1806. In the allied advance into Germany in the Second World War F. fell to the Fr. Army in April 1945. It is now cap. of the S. portion of the former Land Baden. Pop. 110,000.

Freienwalde, summer resort and watering-place in the prov. of Brandenburg, Germany, on the R. Oder, 28 m. N.E. of Berlin. Its forest and chalybeate springs make it a popular resort. Pop. 10,900.

Freight, originally the cargo of a ship, it has now come to mean anything carried for payment either by water or land, whence the term is used for the price paid to the shipowner for the transportation of goods. It was formerly considered that the total F. must cover the wages of the crew and the incidental charges and expenses of the shipping business as well as the interest and depreciation of the capital invested in the shipping. 'Freight was the mother of wages,' but this was modified by the Merchant Shipping Act, 1854. In recent years, owing to the general use of steamers and their increased size the cost of carriage has been considerably reduced, with a resulting great increase in trade. (See INTERNATIONAL TRADE.) Some bulky articles of cargo are sometimes carried at a very low rate because of their usefulness as ballast where a return cargo is sought.

Freiligrath, Ferdinand (1810-76), Ger. poet, b. at Detmold, son of a school-teacher. Apprenticed to a grocer and, by turns, a bank clerk and bookkeeper. Wrote verses for small Westphalian papers and, in 1838, pub. his first vol. of *Gedichte*. Their immediate popularity induced him to turn to literature for a living and he soon found himself one of the favourite poets of his time. Up to 1842 his poetry was free from politics, but his democratic opinions, expressed in the poem *Ein Glaubensbekenntnis* (1814) and the poem *Trotz-alldem* (in trans. of Burns's *A Man's a Man for a' that*), *Die Freiheit*, and *England an Deutschland* led to friction with the gov. and he was forced to seek refuge in Switzerland. Here he prepared a vol. of *Englische Gedichte aus neuerer Zeit* (1846) containing trans. from Tennyson, Longfellow, Southey, and others, and a vol. of political songs entitled *Ca Ira!* The pub. of the last-named led to his flight to London, and in 1848 he was about to emigrate with his family to America to John Loughead and other literary friends when he was allowed to return to Germany. He became leader of the Democratic party in Düsseldorf, but was imprisoned for publishing his poem *Die Totden an die Lebenden*. His *Neue politische und sociale Gedichte*, pub. in 1850, led to further arrest and a charge of lese-majesty, but he was acquitted and left for London. While again working as a clerk he pub. a trans. of *Hiawatha* in 1857 and also trans. of *Cymbeline* and the *Winter's Tale* for a Ger. ed. of Shakespeare, ed. by Bodenstein. Following political amnesty he returned to Germany and at Stuttgart pub. some songs, such as *Hurrah Germania!* and the *Trompele von Gravelotte*, which became very popular. From a literary standpoint his best poems are

Die Auswanderer, *Prinz Eugen*, *Moos-there*, *Die Blumenrache* (*Revenge of the Flowers*), and others, written before 1840. An ed. of his collected works was pub. in 6 vols. in 1870 and in 2 vols. in 1871 and since. There is also a Tauchnitz ed. The charm of F.'s poetry lay in its originality of subject and sentiment, while in a number of his poems, such as *Skating Negro* and *Revenge of the Flowers*, there is an element of the grotesque and eccentric. See G. Freiligrath, *Erinnerungen an F. Freiligrath*, 1889; L. Schröder, *Ferdinand Freiligrath*, 1907; E. G. Guddo, *Freiligrath: Entwicklung als politischer Dichter*, 1922; G. W. Spink, *Freiligraths Verbannungsjahre in London*, 1932.

Freischütz (free shot), in Ger. folklore, a marksman who has obtained a number of magic bullets (*Freikugeln*) from the devil, six out of every seven of which always hit the mark, while the seventh is at the disposal of the devil himself. The legend, with various modifications, was most prevalent from the fourteenth to the sixteenth century, but it first received literary form in Apel's *Gespensterbuch* (1810) from which it was adapted by F. Kind for Weber's opera, *Der Freischütz*, 1821. See —, Grässle, *Die Quelle des Freischütz*, 1875.

Freising, or **Freisingen**, tn. of Upper Bavaria, Germany, situated on the Isar, 16 m. N.N.E. of Munich. It is of ancient origin, and supposed to have been founded by the Romans; it was made a bishopric in 724. In 1802 the see was united to the bishopric of Munich, then newly created. The cathedral is noted for its remarkable crypt. There are distilleries, breweries, saw-mills, dye-works, and manufs. of machinery. The tn. fell to the Amer. forces in April 1945. Pop. 17,200.

Fréjus (Rom. *Forum Julii*), tn. in the dept. of Var, France, 22 m. S.W. of Cannes. It has been an episcopal see since the fourth century, and has sardine and anchovy pickling works. The tn. was founded on the site of an earlier vil. by Julius Caesar, and contains many Rom. remains, including walls, a light-house, an amphitheatre, and an aqueduct. It is now a health resort. Pop. 12,900.

Fremantle, chief seaport of W. Australia, situated at the mouth of the Swan R., 12 m. S.W. of Perth. The harbour has 10,000 ft. of berthing space, and has mechanical aids for loading and discharging and the bulk handling of wheat. There are churches and recreation grounds. The prin. manufs. are leather, biscuits, flour, beer, lumber, soap, and iron and steel goods; and there are cold storage works and wool warehousing undertakings. Pop. 30,000.

Frémiet, Emmanuel (1824-1910), Fr. sculptor, b. in Paris, was the nephew and pupil of Rude; he chiefly devoted himself to animal sculpture and equestrian statues in armour, singly and in groups, the best of which are 'Joan of Arc', 1874, in the Place des Pyramides, Paris; 'Condé', 1881; 'Joan of Arc', 1889, at Nancy; 'Velasquez' in the Jardin de l'Infante at Paris. He also excelled in imaginary groups, chiefly of animals:

'Gazelle,' 1843, exhibited at the Salon; 'Gorilla carrying off a Woman,' 1887. He became a member of the Académie des Beaux-Arts in 1892. See life by Bliez, 1900.

Frémont, John Charles (1813-90), Amer. explorer, b. at Savannah, Georgia. From 1842 to 1854 he explored Oregon, New Mexico, and California. In particular, he explored the S. pass of the Rockies, and estab. the practicability of an overland route; and the Great Salt Lake, and the upper reaches of the Rio Grande. He also rendered valuable service in the Mexican war. He came into national notice again in 1856 when the Republican party was founded. Although it had far abler men in its ranks, it nominated F. for president in the anti-slavery interest, but he was not successful. Without consulting the president, he issued a proclamation confiscating the property and freeing the slaves of all Missourians who took up arms against the gov. President Lincoln removed him from his post, but afterwards gave him a chance to serve in an important command. F. declined. He was ruined in later years in railway speculations and was governor of the ter. of Arizona 1878-81. He pub. *Memories of my Life* in 1887. See life by A. Nevins, 1928.

Fremont: 1. City of N. Ohio, U.S.A., and the cap. of Sandusky co. It is situated on Sandusky R., about 30 m. S.E. of Toledo, and 103 m. N.W. of Columbus, in the midst of a petroleum region. The chief manuf. are cigars, linc, agric. implements, cutlery, hardware, paper, machines, boilers, etc. Pop. 11,700. 2. City of Nebraska, U.S.A., and cap. of Dodge co., situated on the Platte R. There are stockyards and packing-houses, and it is an important market for grain. There is a normal school situated here. Pop. 11,800.

French Art. Architecture.—During the Middle Ages were built the great Fr. cathedrals and churches, with their sculptured decorations, metal work and stained glass; while in the period of the Renaissance, many of the most notable châteaux were built. Amiens cathedral and St. Pol de Léon, Brittany, exemplify the elements and various phases of the Gothic style of architecture in France in the thirteenth century. Traces of the Romanesque tradition are revealed in such Gothic cathedrals as those at Bayonne, Toulouse and Perpignan. Fortified châteaux were also built in the early Gothic style. Famous examples are those of Carcassonne (thirteenth century), Avignon, and the abbey of Mont St. Michel. Famous, too, as an example of architecture of the Middle Ages are the few arches which remain of the bridge at Avignon (q.v.). The bridge of St. Etienne (Limoges), and the bridge at Cahors illustrate the work of Fr. architects in this field. In the fourteenth century the Gothic style shows changes notably in the development of window tracery and in the gallery. Evreux cathedral and St. Jean at Soissons exhibit these changes. A fine example of Gothic development in

civio buildings is the tower of the old tn. hall of Bourges. In the late fourteenth, fifteenth, and early sixteenth centuries Gothic art underwent further changes, especially in the way of complicated or flamboyant decoration. Among some of the most magnificent structures of the fourteenth century are St. Maclovi at Rouen (q.v.), the church of Brou, and the cathedrals of Toul and Quimper. Fr. architecture of the Renaissance stems from Italy but was metamorphosed by Fr. architects and master-masons into something very different from its It. exemplars, revealing a high degree of skill in blending the attenuated grace of Italian ornament with the general lines of Gothic design (André S. Blum). Fine examples are the châteaux of Châteaudun, Amboise, and Chambord. The main work of the early Fr. Renaissance architect is, however, to be found in house building, by such famous architects as Philibert de l'Orme and Pierre Leveçot. Fr. seventeenth-century architecture is Palladian, tempered by a refined baroque. Mansart's (q.v.) dome of the Invalides and Versailles Palace are striking reminders that the state at this period spared no expense in emphasizing its own prestige. Interior splendour and great developments of formal garden art characterized the work of Jean Marot and Louis le Vau, the latter of whom designed the château of Vaux-le-Vicomte, near Melun. Much of the later architecture of France is merely Renaissance revivalist, or a reproduction of classical elements.

Painting.—Miniature painting and illuminating were practised in the Middle Ages and some of the most famous illuminated pointers came from Paris. France contributed much to the formation of the Gothic style in miniature work. The illuminations of the fourteenth century were in realistic style and the Parisian school was noted for the brilliant work of Jean Pucelle. The stained-glass workers of Chartres, inheriting the traditions of St. Denis, contributed their beautiful mosaics to the decoration of eccles. buildings, and also highly decorative in tendency were the metal work and mural painting, which latter imitated the colouring of the stained glass. Early Renaissance painting in France was inspired by the work of Its. summoned to France by kings and municipalities, though there were traces of a change in Fr. art, transforming the Gothic, even before the renaissance of the antique. Jean Fouquet (q.v.), the greatest Fr. painter of the fifteenth century (temp. Louis XI.) was also noted for his illuminated work; also notable was the miniaturist, Bourchon.

Fr. painting of the seventeenth century is represented chiefly by the work of Claude of Lorraine (1600-82) (q.v.) and Nicolas Poussin (q.v.) and also, though in much less degree, by the realistic work of Callot (1592-1635) (q.v.). Poussin was the originator of the classic landscape, in which gods and heroes are depicted in a natural environment. Claude of Lorraine was also a classic landscape painter

with a passion for light and he has often been compared to Turner. Of the same period are the portraits of women distinguished as Olympian divinities, by Jean de Laugillière, the decorative work of Charles Le Brun (1619-90) and the graceful figures of Pierre Mignard (1617). The famous names in Fr eighteenth century painting are those of Antoine Watteau (1684-1721) (q.v.) Jean Baptiste Chardin (1699-1779) (q.v.), Jean Baptiste Greuze (1725-1805) (q.v.), and Honoré Fragonard (1732-1806) (q.v.). Watteau is famous for his scenes galantes depicting amorous couples in highly realistic landscape scenes. Youth gaiety, innocent gowns

Troyon, Rocard, Ribot, Cabanel, and Gustave Moreau, Prud'hon (1758-1827) (q.v.), an enthusiast for Gk beauty, is famous for his allegories of love. David (1748-1825) (q.v.) who strongly influenced the period, was a neo-classicist and may be said to have founded a school of historical painting. His greatest pupil was Jean Auguste Dominique Ingres (1780-1867) (q.v.) who however also derived much inspiration from Raphael. But the feature of the nineteenth century period of Fr painting was the struggle between classicism and romanticism. The leader of the Romantics' revolt was Delacroix (1798-1863) (q.v.), a place that might well



'SOUVENIR DE MORTONIANE' A LANDSCAPE BY J. B. C. COROT 1796-1875)

the play of arms and hands all have their part in the seductive dreams of his terrestrial Olympus. Chardin wins above all the painter of the *petit boudoir* and the poet of still life. Greuze too is notable for his idyllic studies but to-day he is still more highly regarded for his pictures of dim-witted maidens. Mythology, landscape and feminine nudes are all subjects of Fragonard's vivacious work. Other names of this period are Louis Boucher (1702-1770) (q.v.) N. J. Lartet (1690-1743) Maurice Quentin de la Tour (1704-86), Jean Marc Nattier (1685-1766), Madame Vigée Le Brun (1755-1842) (q.v.) chios, a portrait painter, and the battle painter Casanova de Seingalt (1730-1805) (q.v.).

Among the chief Fr painters of the nineteenth century are Jacques Louis David, Regnault, Vernet, Sisley, Prud'hon, Ingres, Delacroix, Corot, Dührer, Courbet, Manet, Gauguin, Dufy, Monet, Renoir, Seurat, Pissarro, Millet, Daubigny, Théodore Rousseau, Constant

have been taken by Géricault (1791-1824) (q.v.) who died prematurely. A lyrical Delacroix looks upon his art as a medium for the expression of his own personality and temperament. Military painters who enjoyed a vogue in this period were Horace Vernet (1789-1863) (q.v.) and Paul Delaroche (q.v.). Corot (1796-1875) (q.v.) was however, the great master of the new school of Fr painting. No other artist has been so imitated. He enjoyed, especially in his later years an extra ordinary popularity. He is famous for his poetic landscapes—luminous and misty—and for the plastic masters shown in his figure-pieces—often a girl reading or a reclining woman, and either a full or half figure. Somewhat opposed to Corot was the 'Barbizon' (q.v.) group or 'independent school—a school of pure' landscape painters inspired by the Low Country painters Holbein and Ruisdael. Fr painters of this group are Jean François Millet (q.v.), Daubigny (q.v.), Théodore Rousseau

(q.v.), and Constant Troyon (q.v.). Gustave Courbet (1819-1877) (q.v.) also reacted against the classicists, but, as a realist in nature painting, he also reacted against the Romanticists. Manet (1832-1883) (q.v.), may also be regarded as a realist, shocking the world, as he did, with studies inspired by Giorgione's 'Sleeping Venus.' Claude Monet (1840-1920) (q.v.) is famous as the head of the Impressionist school. He shows remarkable subtlety in painting the variations of atmosphere and light at different times and places. He began as a member of the Courbet group. One of his principles was that what the subject intrinsically is really does not matter, but only its appearance under light. Other painters of this school are Renoir (q.v.) and the neo-impressionist, Pissarro (q.v.). Hilarie Germaine Edgar Degas (1834-1917) (q.v.), a famous realist of the '50s and '60s, studied with the classicists and so tempers the new naturalism with a sense of structure and form. His themes are generally taken from contemporary Parisian life—particularly dancing girls, *modistes*, and washerwomen. Daumier (1808-79) (q.v.) began as a cartoonist and his paintings attracted only the discerning critics in his lifetime, yet to a greater degree than with most of his contemporaries they reveal the plastic vitality which is associated with the masterpieces of Cézanne. Cézanne (1839-1906) (q.v.) learned from Manet and Pissarro before his own revolutionary ideas made him a lone iconoclast, violating every law of representation as known to the realists and yet clinging to nature as source and inspiration. He is first among modern artists by reason of both spiritual leadership and achievement in his own art. From his work a new western esthetic has been fashioned, schools of painting have derived their inspiration, and a revolution in practice has taken place. Among portrait painters of the nineteenth century may be mentioned Ricard, Cabanel, and Ribot. Puvis de Chavannes (1824-1898) (q.v.) is important in the technique of decorative painting. Paul Gauguin (1848-1896) (q.v.) reverted, for inspiration, to primitive art as illustrated by life in the South Sea Is. Henri Rousseau (1841-1910), also known as Le Douanier, painted scenes of everyday life in France and in Mexico, where he soldiered.

Famous twentieth-century painters are Georges Braque (b. 1881) (q.v.), Henri Matisse (b. 1869) (q.v.), and Pablo Picasso (b. 1881) (q.v.). Braque is notable for his cubist technique; Picasso is supreme as an experimentalist in a small field of abstract expression. The work of Matisse is masterly in its summary expression of form and rhythm and has much in common with E. painting. Seurat (q.v.) is a neo-Impressionist expert in the *pointilliste* system. Symbolism, as in Fr. literature, has dominated the Fr. painting of the twentieth century. In painting it owes something to medieval art and to the work of Gauguin. The symbolists use form more as a formula for expressing their own emotions than for a self-

contained work of art. Also of the twentieth century are the *fauves* or 'wild men,' a group brought together as exhibitors in 1905, representing various degrees of unorthodoxy. Among them may be mentioned Matisse, André Derain, Maurice Utrillo, Raoul Dufy, Georges Rouault, Dunoyer de Segonzac, and others, all of whom would now be regarded as 'solid moderns.' (See also under individual names.)

Sculpture.—The art of portraiture in sculpture began in France in the late fourteenth century, the masterpieces of Gothic sculpture of the period being the sepulchral effigies at Dijon, effigies which gradually replaced the recumbent figures. A notable sculptor of the Renaissance period was Michel Colombe (1431-1512). Jean Goujon (q.v.), skilled in bas-relief, Germain Pilon (q.v.), and Jean Cousin (q.v.) are all well-known artists who succeeded in moulding the Florentine spirit to Fr. genius. The Renaissance in France also saw brilliant enamelling work, especially by Léonard and Jean Limousin (q.v.); the ceramics of Bernard Palissy (q.v.); and much fine work by Fr. goldsmiths. Themes from classical mythological were generally chosen by these renaissance artists. In the earlier part of the seventeenth century Fr. sculpture was still mainly sepulchral, notable sculptors in this kind being François Anguier (c. 1604-69), who modelled the due de Montmorency's tomb at Moulins, and Jacques Sarrazin (1588-1660), sculptor of Henri de Condé's tomb at Chantilly. Later in the century came Girardon (1628-1715), whose masterpiece is Richelieu's tomb in the Sorbonne church, and Coysevox (1640-1720) (q.v.), whose portrait sculptures are remarkable for their vitality. In the same century a regular school of engraving developed at the Gobelins under Sébastien Leclerc and the industrial arts were enriched by the cabinet inlaid-work of Boulle (q.v.) and the incised *objets d'art* of the Fr. silversmiths. It is to be noted that most of the seventeenth century Fr. art of the reign of Louis XIV, whether in painting, architecture or sculpture was 'dictated' art, organised under the direction of Le Brun (q.v.), the king's chief painter, director of the Gobelin workshop, rector of the Royal Academy of Painting and Sculpture and Colbert's technical adviser; and the work of the artists so commissioned suffers to some extent from this official inspiration; but under Colbert's forceful administration Fr. artists of this, the classical period of the *Grand Siècle*, succeeded in profoundly influencing art throughout Europe.

Modern Fr. sculpture is represented pre-eminently by Rodin (1840-1917), though mention should be made of Rude (1784-1855) (q.v.) whose work translates the feelings of exaltation engendered by recollections of the battles of the revolution and empire. Rodin is the one world genius of sculpture between c. 1550 and 1910, i.e. between Michelangelo and Lehmbruck. Rodin, believing that the art of the sculptor had fallen on a

desert of invention, held aloft the torch of structural beauty as opposed to beauty in the abstract. Maillol (*q.v.*) and Despiau belong definitely to a period that is past and a period the formulae of which are past; but by the quality of their workmanship they have become part of the hierarchy of sculptors whose reputation will endure. Another notable sculptor is Antoine Bourdelle (*q.v.*), the best sculptor of the old school and an expressionist who eschewed academicism. Degas, the painter, was also as good a sculptor as painter. Other modern sculptors include Bartholomé and Morcille. See also ART; IMPRESSIONISM; PAINTING, SCULPTURE. See A. S. Blum, *A Short History of Art* (trans.), 1926; A. Clutton Brock, *An Introduction to French Art*, 1931; S. Cheney, *A History of Art*, 1938; E. Cischia, *La Sculpture en France depuis Rodin*, 1945; J. Rewald, *The History of Impressionism*, 1947; and Joan Evans, *Art in Medieval France*, 1948.

French Bulldog, see under BULLDOG.

French, Daniel Chester (1850-1931), Amer. sculptor, b. at Exeter, New York; studied at Boston and had studios at Washington, Boston, Massachusetts, Concord, Massachusetts, and New York. His best-known works are a statue of Gen. Grant at Washington; Rufus Choate at Boston Court House; John Harvard at Cambridge, Massachusetts; the Millmore Memorial, Paris Salon, 1892; statue of the republic at Chicago Exposition; four groups, Europe, Asia, Africa, and America, in front of New York Custom House; Abraham Lincoln at Lincoln, Nebraska.

French, Sir John Denton Pinkstone, see YPRES, ENGL. OR.

French and Indian War (1754-60), last of series of wars between France and Great Britain, the Fr. being assisted by sev. Indian tribes. The prin. events of it were: capitulation of Washington and Fort Necessity, 1754; Braddock's defeat, 1755; capture of Oswego and Fort William Henry by Gen. Montcalm, 1756-57; capture of Fort Duquesne, 1758; and of Ticonderoga and Niagara, 1759; battle of Quebec, 1759; surrender of Montreal, 1760.

French Equatorial Africa (formerly French Congo), colony of France on the W. coast of Africa, between Cameroon and the Belgian Congo, bounded by the Mbomo, Congo, and Ubangi Rs., and stretching inland, northwards, to Lake Chad. The estimated area is 959,236 sq. m., with a pop. of 4,112,200 natives, and about 7800 Europeans. By decree in 1910 the name of the colony was changed to F. E. A., comprising the Gabun colony (92,218 sq. m., pop. 421,000; cap. Libreville); the Middle Congo (166,069 sq. m., pop. 626,000; cap. Brazzaville); the Ubangi-Shari-Chad colony, but now two separate colonies: Ubangi-Shari (238,767 sq. m., pop. 947,300; cap. Bangui), and Chad (461,202 sq. m., pop. 1,432,900; cap. Fort Lamy). All these colonies were put under the authority of the governor-general of F. E. A. Each colony had, however, its own administrative council under a Lieutenant-governor. By a decree of 1934 F. E. A. was constituted a single

administrative unit under the governor-general, who is assisted by an administrative council, and a secretary-general, who acts as his deputy in the governor-general's absence. The headquarters of the governor-general are at Brazzaville. To the consultative assembly elected on Oct. 21, 1945, F. E. A. sent four delegates, two elected by Fr. citizens, and two by Fr. subjects. The boundary between the colony and the Anglo-Egyptian Sudan was defined in 1921. By the convention of Nov. 14, 1911, France agreed to cede certain parts of the colony to Germany in return for the recognition of her protectorate in Morocco; the amount ceded was about 107,270 sq. m. with a pop. of about 1,000,000. At the same time Germany ceded to France 6450 sq. m. of the Gcr. Cameroons.

The low-lying coast extends about 200 m., broken by the mouths of the Gabun (estuary 10 m. wide), and Ogowe Rs. Behind the coast rise the Crystal Mts. (3000-4500 ft.), and a general plateau (3000 ft.) deeply cut by the riv. valleys. The climate is equatorial, but varies greatly in temp. on the coast and in the mts. In some dists. 120-130 in. of rain fall annually. Most of the colony is still unexploited, and there is undoubtedly an enormous quantity of valuable timber in the dense tropical forests. The tropical forests cover 300,000 sq. m., extending to the Gabun coast. The natives cultivate manioc, and the Europeans coffee, vanilla, and cocoa. The natural products include rubber, gold, diamonds, corundum, tantalum, copper, zinc, and lead. Wild rubber is the most important of the country's resources. Palm oil and coco-nuts are produced to some extent. Coffee, cacao, cotton, peanuts, and sisal are also cultivated, and beeswax, copal, and karite butter produced. Chad colony has large numbers of cattle, sheep, asses, camels, and horses, and ostriches, but no facilities for export. Ivory is an important article of export. Other exports are rubber, woods, palm oil and kernels, coffee, cocoa, and kola nuts. The trade of 1937 was valued at 240,000,000 fr. for imports and 257,000,000 fr. for exports. The chief industries are centred in a tapioca factory, an oil refinery, a tanning, and a match factory. There are more than 160 official schools attended (1946) by 17,000 native pupils, and religious missions have over 130 schools, also attended by some 15,000 native pupils. Brazzaville has primary schools and a secondary school for European children. The budget for the whole colony for 1946 balanced at 1,100,000,000 fr. Brazzaville is connected by rail with the Atlantic at Pointe Noire (318 m.), the line being completed in 1930; but many more railways are necessary before the rich potentialities of the region can be realised. There are some 8800 m. of roads. The main ports are Port Gentil, Libreville, and Pointe Noire (also the chief aerodrome). At Loango steamers have to anchor 3 m. off shore. The central African telegraph line connects Brazzaville with Pointe Noire, the terminus of the Fr. cable from Brest via

Dakar (*q.v.*) and Libreville, and is in communication with the Brit. Atlantic cable. Sev. wireless lines connect Brazzaville with the rest of the colony, and there are numerous radio stations, in the main post offices of the interior. Itadio Brazzaville (1942) is one of the most powerful stations in the world, and broadcasts in numerous languages. There are over 3250 m. of telegraph line.

In the autumn of 1940, some months after the collapse of France, F. E. A., under the able coloured governor-general, Félix Eboué, declared for Gen. de Gaulle, leader of the Free Fr. and ally of Britain. The Brit. Gov. collaborated with the gov. of F. E. A. in the disposal of the Fr. colony's large surplus products. In 1940-1941 strategic roads were constructed by the Fighting Fr. administration from Duala (in the Cameroons), N.E. to Chad and thence E. to Darfur (Anglo-Egyptian Sudan), and from Duala E. to Bahr el Ghazal (Anglo-Egyptian Sudan). The former is joined at Fort Lamy by roads from Lagos and Takoradi (Brit. W. Africa). It was from Fort Lamy that Gen. Leclerc started out at the head of the Fr. expeditionary force which conquered the Fezzan. See under FEZZAN. See P. B. Du Chaillu, *Exploration and Adventures in Equatorial Africa*, 1861, 1915; F. W. H. Migeod, *Across Equatorial Africa*, 1923; A. Gide, *Voyage au Congo*, 1927, and *Le Retour du Chad*, 1929; M. Rondet-Saint, *L'Afrique Equatoriale Française*, 1930; G. Brueil, *L'Afrique Equatoriale Française*, 1930, and *La France Equatoriale Africaine*, 1936; J. Malgrat, *L'Afrique Equatoriale Française*, 1931; C. Chavannes, *Le Congo Français*, 1937; and A. Schweitzer (trans. by Mrs. C. E. B. Russell), *From my African Notebook*, 1938.

French Gardening. see GARDENING. *Market Gardening, including French Marketing.*

French Guiana, or Cayenne. Fr. overseas dept. on the N.E. coast of S. America, separated from Dutch Guiana on the W. by the Maroni R., and from Brazil by the Oyapock and the Tumuc-Humac Mts. Other rvs. are the Aroua, Aproaguana, Cayenne, Sinnamari, and Mana, all obstructed by falls. The country is divided into three natural belts: the rugged, mountainous, little-known interior covered in dense forest rich in valuable timber, the grassy savannah-land of the foothills, and a narrow belt of rich alluvial land along the coast. This last is very fertile, and here, though only about 8000 ac. have been cultivated, maize, manioc, rice, sugar-cane, coffee, cocoa, tobacco, and indigo are grown. There are two rainy seasons, and the rainfall frequently amounts to 135 in. in a year. The country is rich in animal and vegetable life. The minerals exploited include silver, iron, and phosphates, and, most important of all, placer gold. The prin. exports are gold, cocoa, phosphates, hides, woods, rosewood essence, balata, and spices, of which gold is by far the most important; and the chief imports are Fr. wines, spirits, and liqueurs, silk and cotton stuffs, hardware, flour, and cattle. F. G.

is administered by a governor assisted by a Privy Council. There is also a Council-General elected by Fr. citizens resident in the country. Primary education is free in ly schools in the coms., and many vils. There are also a college, founded in 1936, sev. Congregational schools, and private schools.

In the seventeenth century Bertrand d'Ugeron, buccaneer chief and governor of St. Christopher, won a foothold in Guiana, but was driven out again by the Spaniards. Itchelieu harboured great plans respecting Guiana, and under his protection Chantall, from Lyons, left to explore Cayenne, and numerous Norman shipowners followed in his track. Pierre de Brétigny settled there, only to perish at the hands of the Indians. Later the Dutch seized Cayenne. Colbert drove them out and, under the provisions of the Black Code, organised the first convoys of man-power from Senegal to Guiana. In 1700 the Dutch again estab. themselves in Guiana, but two decades later, after the loss of Acadia, the Fr., under Choiseul, sent 8000 settlers to Guiana, but they were decimated by epidemics. Under the Restoration the Fr. freed the colony from a brief Portuguese occupation, but the emancipation of the Negroes ruined the colony. From 1853 to 1861 an attempt was made to found penal colonies in F. G., but proved disastrous. Since 1854, however, Cayenne has had a penal settlement, though no prisoners were sent there after 1927. In 1945 the pop. of the settlement was little more than 1500, and prisoners were gradually being sent back to France. There are also penal settlements on the îles du Salut and on the Maroni R. In 1894 Capt. Dreyfus was confined on the île du Diable. Cayenne is the cap. and chief port of the dep., which sends one deputy to the Fr. National Assembly. At Cayenne there are a court of first instance and a superior court of appeal, with jurisdiction elsewhere in the colony. St. Laurent-du-Maroni and Oyapoco are the two other chief ports. The Pan-Amer. Airways system visits Cayenne weekly. The cap. is connected by motor-car services over secondary roads, with centres of pop. in the interior. There are wireless stations at the ports and at Regina. Cayenne has been colonised by the Fr. since 1604. Total area 31,740 sq. m. Pop. 28,500. The number of the native pop., which dwells in the forested interior, cannot be estimated.

The ter. of Imlil includes the hinterland separated from F. G. by a decree of 1930. It is administered by the governor of F. G., who is assisted by a small consultative council. The area is 30,301 sq. m. and the pop. 5000. Maroni is the chief centre.

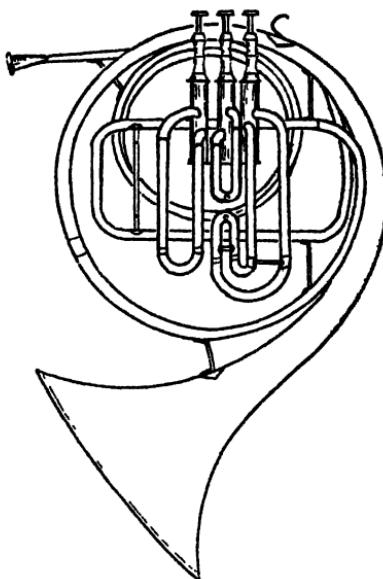
French Guinea. Fr. colony on the W. coast of Africa, formerly known as Rivière du Sud. It lies between Sierra Leone and Portuguese Guinea. The prin. products are rubber from the interior, palm oil and kernels on the coast; cotton is cultivated in the higher basin, and millet, sesame, rice, coffee, bananas, pineapples, wax, and ivory are largely pro-

duced. Cattle, sheep, and goats are reared, and gold is found in some dists. The chief imports are cotton goods, metal goods, wines, tobacco, petrol, and salt. In normal times the export trade is worth over 70,000,000 fr., and the prin. exports (in 1938) were gold, hides, bananas, palm kernels, animal wax, and orange oil. At Camayenne, near Konakry, the cap. of the colony, is an experimental garden. The F. G. railway, 412 m. long, runs from Konakry on the coast to Kourassse on the Niger, and on to Kankan, and many good roads are being built to connect up with the railway. Konakry, which has a jetty over 1000 ft. long, is served by four shipping companies (three Fr. and one Brit.), and has a wireless station affording communication with Dakar, Bamako (Fr. Sudan), and Grand Bassam (Ivory Coast). F. G. is administered by a lieutenant-governor under the direction of the governor-general of Fr. W. Africa. Geographically the colony is divided into three dists.—a flat coastal plain, a series of lofty plateaux, and the mountainous dist. of Fouta Djallon, where cattle are reared. In 1824 René Caillié, from Senegal, reached Rio Nunez and, disguised as an Egyptian, traversed the Fouta Djallon. Faidherbe sent missions there. In 1837 the exploration of the gulf of Guinea was solidly estab. the reputation of Bouet Vuillainez, who travelled through the grain, gold and ivory coasts. In 1882 the Brit. Gov. recognised the treaty France had concluded with the lord of Fouta Djallon, and a commission settled the Fr. frontiers and those of Sierra Leone. F. G. was made a separate colony from Senegal in 1891. In 1896, following disorders, Fouta was annexed and France appointed a governor of F. G., the boundaries of which were finally settled in 1899. Total area 96,800 sq. m. Pop. 2,125,000, of which under 3000 are European. The chief native tribes are the Foulaahs, Sous-sous, and Timunes. See A. Arcin, *La Guinée française*, 1906; F. Rouget, *La Guinée*, 1908; and R. Gouzy, *L'usage de l'Afrique*, 1939.

French Honeysuckle, see HONEYSUCKLE.

French Horn (Fr. cor, *cor de chasse*. Ger. horn, *waldhorn*), brass wind instrument, used in orchestral music, with a particularly soft tone, due chiefly to the funnel-like bore of the mouthpiece, but also to the length of tube and shape of bell. Originally it was employed in hunting from a very early period, but was introduced into the orchestra at the beginning of the eighteenth century, and now holds one of the most important positions, as it is the softest toned brass instrument used, and forms a fine contrast to the others. It is seldom used singly, two or four being the usual number in the orchestra. It consists of sev. spiral coils, with a funnel-shaped mouthpiece at the upper and a bell at the lower end of the tube, the length of which is varied by the introduction of crooks of different lengths. There are also supplementary tuning crooks and a tuning slide. Music for the horn is always written in the G or treble clef, the notes actually sounded

depending on the crooks used. In 1770, Hampl, at Dresden, discovered the method of forming intermediate notes by hand-stopping, viz. introducing the open hand with fingers close together into the bell, and thus lowering the pitch by a semitone. Nowadays the horn is provided with valves which bridge over the intervals and render the hand-stopping unnecessary. The horn is a difficult instrument to play by reason of the number of open notes and frequent changes of pitch.



FRENCH HORN

French India. The Fr. possessions in India comprise the five provs. of Pondicherry, Karaikal, Chandernagur, Mahe, and Yanam, each with its cap. of the same name. The chief crops are manioc, paddy, rice, and ground nuts; chief exports, oilseeds. There are cotton and jute mills. Total area about 196 sq. m. and a pop. of 396,100.

French Indo-China, see INDO-CHINA
FRENCH.

French Language and Literature. *Language.*—The Fr. language is one of the Romance tongues. It is not a direct outcome of classical Lat., but of the *lingua romana rustica*, the common language spoken by the Rom. legionaries and merchants. The original Celtic tongue of the inhab. of Gaul d. away except in Brittany, leaving extremely few traces. It survives in a few words such as *étoile*, *sac*, *heure*, *brave*, and influenced the form of some words of Lat. origin. The Franks who invaded Gaul during the fifth century

had more effect upon the language, and many words are of Frankish origin, as *guerre*, *slef*, *biere*. The *lingua romana* took different forms in Fr. according to the races and environment. Two main divs. are easily made, in the S. the *langue d'or* and in the N. the *langue d'oïl*, so called from the words used to denote affirmation. The line of div. would run approximately from La Rochelle to Grenoble, through Limoges, Clermont-Ferrand, and Lyons. Formerly it was customary to regard the *langue d'oc* as part of the Fr. language, but it is now held to be a distinct branch of the Romance group. Both languages were further subdivided into numerous dialects and patois. The prin. dialects of the *langue d'oc* were provençal, languedocien, daupinois, auvergnat, and limousin, those of the *langue d'oïl* picard, burgundian, norman, poitevin, and especially that of the Ile de France, which eventually became the main tongue. Its triumph was mainly due to the accession of Hugh Capet, duke of France and of Orleans, to the throne in 987, thereby making Paris the cap. of the kingdom. Even in Romo itself in classical times there were two sorts of languages. There were the Lat. of Cicero and Cesar, taught and spoken by the educated, and the language of the middle and lower classes. The difference lay chiefly in the pronunciation and syntax. The tendency manifested itself to slur over and drop the unaccented syllables. Hence even in classical authors we find *seculum*, *vinculum*, instead of *seculum*, *vinculum*. This tendency also affected the syntax by obscuring grammatical endings, and led to the introduction of independent particles to denote grammatical relation, such as prepositions and auxiliary verbs. In Gaul classical Lat. was still learnt in the schools and affected by the higher classes, but the invasions of barbarians in the fifth century destroyed the culture of the country, and gave free play to the colloquial tongue. The tendencies already remarked above were intensified. The kernel of each word was the accented syllable, which persisted, while the unaccented ones underwent modification or disappeared altogether. Vowels immediately preceding the accented syllable disappeared if short, but were preserved if long, as *claritatem*, *clarité*; *pèrigrinum*, *pèlerin*. Vowels following the accented syllable disappeared, or were reduced to *e* mute, as *mortalem*, *mortel*; *tabulum*, *table*. A medial consonant separating two vowels of which the second is accented also disappeared, or was modified, as *dolâre*, *douer*; *débêre*, *devoir*. Words from the Lat. not following these rules are of learned origin imported at later date. The simplification of Lat. case-endings soon led in *lingua romana* to the reduction of the six cases to two for masculine nouns, the nominative and accusative, and to the accusative onl. for feminine nouns. Thus *rosam* and *rosas* were the feminine forms in Gaulish Lat. for both nominative and accusative in the singular and plural respectively, and gave the modern forms *rose* and *roses*. The masculine *murus*,

murum (singular), and *muri*, *muros* (plural), gave:

	Sing.	Plur.
Nom.	<i>murs</i>	<i>mur</i>
Acc.	<i>mur</i>	<i>murs</i>

The nominative disappeared from use in the fourteenth century, leaving only the accusative form *mur* and *murs*. Traces of the nominative still remain, however, in *on*, besides *homme* from *homus*, *src*, besides *seigneur* from *senior*, and in proper names *Jacques*, *Georges*, etc. The Académie Française, with its forty members called the Immortals, was estab. in 1635 and is the final authority on all matters connected with the Fr. language.

Fr. was the acknowledged language of diplomacy, of science, and of the cultured from the days of Louis XIV., but lost its position after the First World War. It is spoken by sev. millions of people outside the Fr. Union, in Belgium, Switzerland, and Canada. See Joachim du Bellay, *The Defence and Illustration of the French Language* (trans. by Gladys Turquet-Milne, 1939), 1549; A. de Rivalz, *Discours sur l'universalité de la langue française*, 1784; M. Darmesteter, *Cours de grammaire historique*, 1891-97; F. Brunot, *Histoire de la langue française*, 1913; and W. von Wartburg, *Evolution et structure de la langue française*, 1946.

Literature.—As already stated, the Fr. language arose from the *lingua romana rusticæ*. In course of time the pure Lat. language became no longer recognisable by the speakers of the *lingua romana*, and various glossaries were compiled for the aid of those who wanted to read Lat. texts. Such glossaries afford the earliest monuments of the Fr. language. The glossary of Reichenau belongs to the end of the eighth century, and contains the Lat. words of the Vulgate with their Romance equivalents. Another glossary, that of Cassel, contains some old Ger. words with Romance equivalents. The earliest consecutive monument of the Fr. language is the oath of Strasburg, made in March 842. The empire founded by Charlemagne was divided by his three grandsons, and two of them, Charles the Bald and Louis the Ger., swore to aid each other against their elder brother Lothair. Louis the Ger. uttered his oath in the Romance tongue in order to be understood by Charles's soldiers, and the form was as follows: 'Pro Deo amir, et pro Christiano poble et nostro commun salvament, d'ist di in avant, in quant Deus savir et podir me dunat, si salvatu eo est meon fradre Karlo, et in adjudicatu et in cadhuna cosa, si cum on per dreit son fradra salvat diffit, in o quid il mi altresi fazot, et ab Ludher nui plaid nunquam prindarai qui, meon vol, cist meon fradre Karlo in damno sit.' The Eng. trans. is: 'For the love of God and for the common safety of ourselves and the Christian people, from this day forward, as far as God gives me wit and power, I will defend my brother Charles both by help and by every means, as one should by rights defend his brother, on condition that he do the same for me, and I will make no pact with Lothair, which,

by my will, may be disadvantageous to my brother Charles.'

The literature of the tenth and eleventh centuries consists of the *Séguirce de Ste. Eulalie* and the *Vie de St. Leger* in assonanced verses. The latter poem also exists in versions reworked during the twelfth, thirteenth, and fourteenth centuries, and so enables the student to follow the course of the language. The first great achievement of Fr. literature was the production of the *chansons de geste* (q.v.). These are epic poems narrating the exploits of the heroes of the Frankish nation and celebrating chiefly the deeds of Charles Martel and his grandson Charlemagne. They originated with the Merovingians and were carried by minstrels from castle to castle. In the beginning they were assonanced, but from the thirteenth century they were rhymed. The most famous of all the *chansons de geste* is the *Chanson de Roland*, the earliest text of which is found in the Bodleian MS. at Oxford (1080), but we know that an earlier version was sung at the battle of Hastings (1066). All these *chansons* were gradually compiled by the addition of the work of one minstrel to that of his predecessors, so that they can hardly be said to have any original form. The *Chanson de Roland* has an historical nucleus round which grew a mass of mere legend. There is a vividness of action and a strength in the delineation of character which make the poem a masterpiece. The *Chanson de Roland* forms one of the cycle known as the *Geste de Charlemagne*, while other poems are grouped together into the *Geste de Guillaume d'Orange* and the *Geste de Doon de Mayence*. One of the best poems of the period is *Raoul de Cambrai*, which depicts the feudal conception of fidelity.

The *chanson de geste* gave place to the romances, which are distinguished from them by being the narration of exploits of entirely fictitious heroes, while the former, as we have seen, had always a certain historical content. The material for the romances was taken from the Celtic bards of Brittany, who sang the exploits of Arthur, the last of the Brit. kings and his knights of the Round Table. To this theme were added such tales as the quest of the Holy Grail and the unhappy love story of Tristan and Yseult. The romances were developed from short lays trans. directly from the Breton. The greatest writer of such romances was Chrétien de Troyes (d. 1195), who wrote *Tristan*, *Erec*, *Cigala*, *Lancelot* or the *Chevalier à la Charelle*, *Yrain* or the *Chevalier au Lion*, and *Perceval*. These poems are imbued with that feeling of chivalry and mysticism which has come to be associated with the knightly period, and were imitated throughout Europe. These romantic poems were further developed by the learned troubadours, who wished to display their learning by recounting the deeds narrated in the old Lat. historians. Their chief production is the *Roman d'Alexandre*, a poem of 20,000 lines of twelve syllables which have ever since been known as *Alexandrines*. Others of

the same school are the *Roman de Troie* (30,000 lines) in octosyllables, *Roman d'Enfas*, and *Roman de Thébes*. As the simplicity of the *chanson de geste* yielded to the crudition of the later romances, so these in turn gave place to the elaboration of the allegory. The allegory is a form of didactic poem which presents abstract qualities as living personages. The most celebrated of these is the *Roman de la Rose*, of which the first part was written by Guillaume de Lorris about 1230. It represents in simple, elegant, and vigorous language the feelings of a diffident lover in courting his beloved. The second part is much longer, and entirely different in its inspiration. The author, Jean de Meung, simply uses the framework left by his predecessor as a vehicle upon which to depict his witty and satirical sketches of the society of his time. The range of subjects dealt with is encyclopedic, and the influence of the poem was enormous.

One of the most characteristic forms of Fr. literature is the *fableau*, which came into great favour in the thirteenth century. The *fableau* is a short simple story in verse, full of pregnant reflections upon society, of wit, satire, and a certain pungent coarseness. Such poems are important as being a manifestation of the *esprit gaulois*, a term used to denote that quality of levity, raillery, satire, and gaiety which is to be found throughout Fr. literature. The *fableaux* were preceded by collections of fables which bore the name of *usopet*, from the celebrated *Aesop*. The best known of these was the *Roman de Renart*, a kind of humorous epic poem dating from the twelfth century, in which the animals are endowed with human characteristics, and the fox's cunning enables him to triumph repeatedly over his less sagacious rivals. The *Roman de Renart* has retained its appeal throughout the centuries, and was used by Goethe. Of the *fableaux* the prin. are *Le Vilain Mire* (The Peasant Doctor), *Estula*, and *Les Perdrix*. They are extremely varied, full of local incident and colour, and of great utility in forming an idea of the social life of the period. The most celebrated writer of *fableaux* was the poet *Rutebeuf* (d. c. 1280), who wrote many mordant satires against women, mendicant friars, the univ., and other subjects. He is moreover worthy of note as being the first Fr. poet to introduce a deep personal tone into his poetry.

The lyrical poetry of medieval Fr. literature was an outcome of the popular song. It was to a great degree imitated from the S. nations, the It., and the Spaniards, and from the troubadours of the *langue d'oc*. From these sources the troubadours of the thirteenth, fourteenth, and fifteenth centuries drew their inspiration. Lyric poetry developed upon two lines; as regards subject it sounded in an increasing degree the personal note; in form it became enslaved more and more to certain fixed forms (ballad, rondreau, chant royal, etc.). It is not until the fifteenth century that lyric poets of enduring reputation are found. Among them must be mentioned Alain Chartier (1380-1440),

called the *père de l'éloquence française*; Charles, duke of Orléans (1391–1465), whose poems are full of grave elegance and melancholy, and finally François Villon (1431–60), who gave expression to a new depth of feeling and emotion. His *Petit Testament* and *Grand Testament* relate the excesses of his life, and his *Ballade des Dames du Temps jadis*, with its refrain *Mais ou sont les Neiges d'antan?*, ranks as one of the finest examples of lyrical poetry.

The earliest historical works were written in *l'art*. Afterwards *hist* was written in the form of verse such as *J' l'istorie des Angles* and two poems by Wace, *vis à Brut* (the hist. of the Bretons) and *Rou* (hist. of the Normans). The first important prose hist. is the *Conquête de Constantinople* by Villehardouin (1207), which is a narrative of the events of the fourth crusade. Written to vindicate the author for having been a party to turning the army of the crusaders from their real goal towards a more lucrative object, it yet gives a terse clear account of events and a record of the conflicting counsels of the leaders. A hundred years after Villehardouin, Jean de Joinville at the request of Jeanne de Navarre, wife of Philippe le Bel wrote his account of the sixth crusade which affords a detailed and simple narrative of the doings of St. Louis IX., whose human and saintly qualities are described with such a lack of affectation that the book is one of the most sincere documents of the past. Froissart is a good deal less mediocre in tone than Joinville. His *Chroniques*, written towards the end of the fourteenth century, deal with the events in England, France and Flanders between 1325 and 1374. He astonishes us by his wealth of detail and his care to gather all possible information upon the events described. Philippe de Commynes was the historian of Louis XI. of Charles the Bold, duke of Burgundy, and of the expeditions to Italy under Charles VIII. His work takes us up to the year 1498. He is more than an historian; he is a politician and a thinker. In Louis XI. he had to portray a king who won his way more by diplomacy than by force of arms, and he draws a vivid picture of the characters whom he sets out to portray.

The drama of the Middle Ages took its rise from the church ceremonies. The liturgy was developed by interpolation of Lat. verses and canticles, and afterwards by recited pieces which finally became amplified into such liturgical dramas as *Les Pastorets* and *Les Proches sayes et les vierges folles*. Here the Lat. tongue gradually gave way to the native language, and as the scope of the pieces increased they were removed from the choir to the porch of the church. The *Drame d'Adam* (twelfth century) was the first piece played outside the church. In the thirteenth, fourteenth, and fifteenth centuries arose the miracle plays dealing with the lives of the saints, mystery plays concerned with scriptural subjects and certain epic events of profane hist., such as the siege of Troy and that of Orléans. These myste-

ries often ran to enormous lengths, requiring as many as 100 performers, and seven days for their presentation. In 1548 they were banned by the Parlement de Paris on account of their increasing profanity, but they lingered on elsewhere until the end of the sixteenth century.

The rise of Fr. comedy is very obscure. It appears to have developed from the *dits*, *monologues*, and *débats* that the wandering minstrels carried from castle to castle and from town to town. The first known comedy is the *Jeu de la feuille* by Adam de la Halle, played in 1262 in Arras, while another, *Robin et Marion*, by the same



RONISIUS (1524-40)

author, a pastoral play with a musical accompaniment, was played in Naples in 1255. In the fifteenth century many societies were formed for the presentation of farces, pantomimes, moralities, and softies such as *Les Clercs de la Basoche* and *Les Enfants sans souci* in Paris. Of the farces the most celebrated is *J'Avorat Jafelin* (1470), of unknown authorship, which was modernised in 1572 and is still performed. Mention must also be made of the moralities, allegorical and didactic dramas which were produced until the middle of the sixteenth century.

The sixteenth century ushered in the Renaissance of Fr. literature, the chief causes of which were the discovery of printing (1450), the It. wars (1514–1515) which brought France into contact with a more cultured people and the humanistic movement, which led to the study of the ancient classical authors, and the Reformation, marked by Luther's rupture with the Catholic Church in 1521. The early renaissance in Fr. literature found its most complete expression in Queen Marguerite of Navarre. She was the author of *Heptameron* (1558), an imitation

of Boccaccio's *Decameron*. Outstanding among the poets who enjoyed her patronage was Clément Marot (1497-1544), a courtier who produced some very elegant pieces and some *épîtres* which are of deeper inspiration. He also trans. thirty of the psalms with considerable success.

In 1549 appeared Joachim du Bellay's *Défense et illustration de la langue française*, which set out the tenets of the new reforming party of Fr. poets. These poets grouped themselves round Ronsard, and were known as the *Pélade*. Besides Ronsard and du Bellay, they included Belli, Jodelle, Belleau, Pontus de Thiryard, and Daurat. They endeavoured to give Franco a worthy literary language by imitating from the classics, by coining new words, and by borrowing from the various dialects. Unfortunately the less known poets and their imitators carried these ideas too far and brought ridicule upon the school, which led to the eclipse of the fame of Ronsard. Ronsard during his life was regarded as the greatest of Fr. poets, and his sonnets are of considerable merit. Later, however, he turned his attention to the epic, and produced *Francis* (1572), in decasyllable verse, which proved a complete failure. Du Bellay lacked the variety and force of Ronsard, but was more sincere in his verse. His best poems are contained in *Regrets, Antiquités de Rome*, and *Jeux rustiques*. Belleau wrote pastorals in his *Bergeries*, and du Bartas, a disciple of the *Pélade*, a pretentious work, *La Semaine*, describing the creation of the world, according to the biblical tradition. Agricola d'Aubigné (1550-1630), another disciple of the *Pélade*, a protestant, wrote *Les Tragiques* (1616), a succession of descriptive tableaux dealing with the misery and corruption of the world and with the final judgment.

François Rabelais (c. 1490-1553) is, like Jean Jacques Rousseau in the eighteenth century, a writer whose exact merit it is difficult to assess. Born at Chinon, he was first a monk and then a doctor. He led a very unsettled existence, residing at Lyons, Itome, Metz, and elsewhere. His masterpiece is *Gargantua and Pantagruel*. They are two giants whose fantastic deeds are a burlesque of the Arthurian chivalry, and the vehicle of much sound, if pungent, philosophy. Rabelais's writings reflect the struggle of the Renaissance against the Church, and their improbability and disproportion are but a cloak to cover his attacks. His characters are simple and unrestrained. His doctrine may be summed up as advocating the development of both mind and body, and his rule of conduct was *Fay ce que voudras*. The exuberant humour and rich epic life of his *Gargantua and Pantagruel* doubtless have a deeper meaning than appears on the surface and Rabelais himself tells the reader that he must 'break the bone in order to suck the marrow' if he wishes to find the hidden truth. In the same passage, however, he alludes to the 'doctrine absconse' and 'mystères horribles' in his story; but this bombast indicates plainly that he is jesting, particularly at

the mania of the Middle Ages of trying to interpret all things allegorically. Rabelais relates much merely out of love for his theme, especially the coarse jests and obscenities with which his work abounds, and those who seek some esoteric meaning here will seek in vain; and the opinion that Rabelais's book is a complicated puzzle cannot be too much guarded against. His style is racy and picturesque, full of original imagery, but his power of verbal invention beguiles him and then his language becomes a verbal feast of metaphors, neologisms, latinisms, synonyms, and proverbs jumbled together in indiscriminate confusion. Great writer as he is, Rabelais is quite devoid of any feeling for beauty.

The Renaissance led naturally to the trans. of the ancts., and Amyot's trans. of Plutarch (1539) is specially worthy of mention, serving both to enlarge the scope and to enrich the vocabulary of Fr. literature. Henri Estienne furthered the knowledge of Gk. and at the same time defended the language against the influx of It. words. Montaigne (1533-92) was among the first prose writers of his century. His *Essays* offer an inexhaustible wealth of information upon the varied customs of mankind. To the age-old teaching of Christendom he opposed scepticism based upon the conflicting hist. of the human race. With a pretence of impartiality he states his observations and arrives at his characteristic maxim, *Que sais-je*. His style is simple, unaffected, and spontaneous, and he will always retain his rank as one of the world's foremost essayists.

The drama of the sixteenth century did not show any strong individuality. It consists almost entirely of trans. from Gk., Lat., and It. sources. In 1552 Jodelle produced *Cleopâtre*, the first original tragedy in Fr. Larivée wrote some dozen comedies adapted from the It., but wholly Fr. in spirit; and he may be regarded as the forerunner of Molière. Among the historians of the period mention should be made of Brantôme (1540-1614), whose *Mémoires* contain 'Vies des hommes illustres et des grands capitaines' and 'Vies des dames illustres.' He wrote with vigour, wit, and cynicism. Blaise de Montluc (1502-77), one of the foremost soldiers of his time, was the author of the *Commentaires de Messire Blaise de Montluc* (1592) in which he describes his fifty years' service (1521-74). D'Aubigné, mentioned above, wrote *L'Histoire universelle*, a Fr. hist. from the Protestant standpoint from 1550 to 1601. Among religious works foremost is Calvin's *Institution chrétienne* (1511), the Fr. version of his Lat. work of the same title. It is important as being the first religious work written in the Fr. language. François de Sales's *Introduction de la vie dévote* (1608) also belongs to the sixteenth century by its style. *La Satyre Menippée* (1594), a pamphlet written by seven collaborators, is well known, and was instrumental in reconciling the conflicting religious parties. During the seventeenth century Fr. literature reached its zenith. The progress was not, however, greatly marked in

the realm of poetry, which was content simply to liberate itself from the excesses of Ronsard's followers. The outstanding figure is Malherbe (1555-1628), at first a disciple of Ronsard, but afterwards a zealous opponent of all exaggeration. He insisted upon the use of words of undoubted Fr. origin, and based his verse on the severest models, and thereby founded the classical school. He regularised the Alexandrines, held the *caesura* as essential, prescribed *enjambement* and *hiatus*, and advocated richness of rhyme. Unfortunately, he succeeded at the same time in banishing all lofty inspiration from Fr. poetry and left it formal and lifeless. His immediate disciples were Racan and Maynard, but he found many adversaries among the followers of Ronsard, e.g. Vanquelin de la Fresnaye, Desportes, Bertant, Mathurin de Regnier. The latter accuses Malherbe of being *faible d'invention, froid à l'imaginer, a mere regrettier de syllabes*. Be that as it may, Malherbe's influence grew until he was finally regarded, owing to Boileau's appreciation, as the founder of modern Fr. poetry.

The classical movement was helped by sev. causes. In 1637 Descartes pub. his *Discours de la méthode*, the first Fr. book upon a philosophical subject. Indirectly the work had a great effect upon Fr. literature. It gave to prose a solidity it had never had before. Its theories appealed to Fr. minds, and all the writers of the century were imbued with Cartesian tenets. Philosophy became the property of the ordinary man, after having been confined to the learned. From Descartes the great writers acquired a sense of truth and order, a regulation of their art that finds its highest expression in the classical school. The unity of the language was further promoted by the estab. of the Fr. Academy, which arose out of a small society of literary men who met at the house of Valentin Conrart and discoursed upon literary topics. Richelieu, with his zest for organisation, wished to give this society the prestige of an official assembly, and in 1634 the statutes of the Academy were drawn up. One of them required that the Academy should prepare a dictionary, a work which did not appear until 1694, followed by later eds. Another influence upon Fr. literature in the seventeenth century was the famous *salons*, prin. among which was the Hôtel de Rambouillet, where the most eminent men of letters used to meet with persons of rank and social influence. The result was a refinement of language, the rejection of all coarseness of expression, a striving after elegance, which subsequently degenerated into affectation or *préciosité*. Vaugelas (1583-1650), one of the early members of the Academy, who had the reputation of knowing his own language better than any one and whose decisions were looked upon as laws, pub. his *Itémarques sur la langue française* in 1617—a work which served as a guide to his fellow members in their literary labours. He proposed first to make the language "vraiment maîtresse chez elle" and to clear

it of the rubbish it had garnered; and secondly, he asserted that the test of correct language is the manner of speaking of the best part of court; but if he estab. the supremacy of court he never intended to exclude all development or change. Another prose writer of the period was J. L. Balzac, *le grand épistolar* (1594-1654), whose letters had a wide popularity and were regarded as models of style. His style is rich and vigorous, but somewhat heavy. He has been accused of being merely a maker of phrases, but his works abound in depth and beauty, and include some excellent pages of philosophy, religion, and criticism. Vincent Voiture (1598-1648), also a letter-writer, was greatly admired in his day, and was for some twenty years the leading spirit of the Hôtel de Rambouillet. His style is laboured, but he writes upon a wide range of topics and shows a keen wit. He also wrote poetry of artificial character, his most celebrated piece being the sonnet on Urania, which vied with Benserade's sonnet upon Job, and gave rise to the two factions of Uranistes and Jobelins in the Hôtel de Rambouillet.

The seventeenth century witnessed greater progress in drama than in poetry, and produced the three supreme dramatists of France, Corneille, Racine, and Molière. The glory of Corneille and Racine has faded, and their works have had no lasting effect upon European literature. Ger. dramatists, after following Fr. models for some time, finally turned to the Shakespearian drama, and it may be said generally that the Shakespearian form has finally triumphed over the Fr. classical drama. Neither Corneille nor Racine compare on terms of equality with the Gk. dramatists whom they emulated and whose rules they strove to follow. The fame of Molière, however, shows no diminution, and he is held to be the greatest of Fr. comedy-writers. His satires upon human weakness still retain their force and their appeal.

Before Corneille sev. types of plays rivalled each other for popular favour, principally the tragedy, the tragico-comedy, and the pastoral. The first dramatist of the century was Alexandre Hardy (1560-1630), a prolific writer who produced some 700 or 800 plays, of which forty have come down to us. Though not a great playwright, he nevertheless had a keen sense of dramatic effect, and knew how to marshal his scenes and to set off his characters. He shows greater freedom than do the classical writers in choice of subject, in range of action, and in the number of characters and scenes, and he might, with greater genius, have given a different turn to the drama. After Hardy came Jean de Malot (1604-86), whose tragedy *Sophonisbe* is remarkable as being the first tragedy which strove to give effect to the unities of time, place, and action, which were to dominate the Fr. theatre for two centuries.

Pierre Corneille (1606-84), b. at Rouen, produced his first play, *Médée*, a comedy, in 1629, and it was an immediate success. In 1635 appeared his first tragedy, *Médée*.

In the meantime he had moved to Paris, where he became one of the five authors of Cardinal Richelieu, who drew up the plan of a play and handed it over to those authors to put into suitable form. Corneille had, however, no power of ingratiating himself with the great and was dismissed for lack of *esprit de suite*, or ability to conform with his patron's plans. In 1636 *Le Cid* was produced. Its success was immense, and surpassed that of any previous play. Nevertheless it met with great criticism in sev. quarters and Richelieu submitted the question to the newly formed Academy, which delivered its opinion in the *Sentiments de l'Académie française sur le tragico-comédie du Cid*. In 1640 Corneille produced two plays, *Horace* and *Cinna*, and in 1643 *Polyeucte* and *Pompée*, as well as a very successful comedy, *Le Menteur*. Between 1642 and 1652 he wrote *Rodogune*, *Théodore*, *Héraclius*, *Nicomède*, and *Pertharite*. The latter was a failure, and Corneille then ceased to write until 1659, when he produced *Edipe* and sev. other pieces. In 1671 he wrote his last work, *Sûreña*, which was a failure. After *Le Cid* Corneille always conformed to the three unities of time, place, and action, not, however, without a certain show of restraint. He chose his subjects from hist., particularly dealing with such episodes as illustrate the triumph of the will over the emotions. His characters show great firmness and heroism, and la Bruyère states that he portrayed men as they ought to be, not as they are. In giving the authority of hist. to his characters he made them appear more probable than they otherwise would have done. His style is oratorical and grave. He is poor in imagery, but strong in argument, full of well-stated maxims and brilliant dialogue.

Corneille was ultimately overshadowed by Jean Racine (1639-99), whose first piece, *La Thibaudie, ou les frères ennemis*, appeared in 1664, followed the next year by *Alexandre*, both of them imitations of Corneille's art. In 1667 he produced *Andromaque*, which achieved a great success, and between that date and 1677 sev. other tragedies, *Britannicus*, *Bérénice*, *Bajazet*, *Mithridate*, *Iphigénie*, and *Phédre*, as well as a comedy *Les Plaideurs*. All these were successful, but in 1677 he ceased to write for the theatre owing to religious scruples. In 1689 he wrote, at the instigation of Mme de Maintenon, his tragedy *Esther* (which was produced by the young ladies of St. Cyr), and two years later *Alceste*. Racine, like Corneille, adhered to the unities, but he did so without effort. He presents not the moral qualities but the emotions and passions of his characters. The series of Racine's masterpieces was opened by *Andromaque* (1667), which was as successful as Corneille's *Cid*. The plot was taken from Book II. of the *Eneid* and from Euripides' *Andromache*, with essential alterations regarding the heroine's character. The significance of the play was that it heralded the advent of a new tragic ideal, the very antithesis to that of Corneille,

the substitution of human passion and especially love, for the heroic crises of the will, and for that reason it was coldly received by the partisans of the older dramatist. But Racine's drama is more human and congenial than that of Corneille, and his harmonious and natural style appealed strongly to his audiences. Apart from his plays he wrote numerous lyrics, a *Histoire de Louis XIV.*, and an *Abégé de l'histoire de Port-Royal*.

Fr. comedy before Molière was represented by *Le Menteur* of Corneille and works by J. Rotrou (1609-50) and P. Scarron (1610-60), imitated from the Sp. and It. Jean Baptiste Poquelin, alias Molière (1622-73), founded with the Béjart



family in 1643 *L'illustre Théâtre*, but was forced by want of success to tour in the provinces from 1645 to 1658. In the latter year he came to Paris, where he produced *Les Précieuses ridicules* (1659), which estab. his reputation and then successively *L'École des Maris* (1661), *L'École des Femmes* (1662), *Tartufe*, his masterpiece (1664), *Don Juan* (1665), *Misanthrope* (1666), *Le Médecin malgré lui* (1666), *Les Femmes savantes* (1672), and *Le Malade imaginaire* (1673). He was seized with illness whilst playing in the last-named piece, and d. shortly afterwards. Molière was a great play-wright, and his best comedies are among the greatest that have ever been written. He expresses very happily the Fr. national spirit. His most powerful weapon is ridicule, and strongest aversion hypocrisy and affectation. *Les Précieuses ridicules* exposes the pedantry of the erudite Fr. women. *Tartufe* is a type of the religious hypocrite. In *l'Itrare* (1668) he portrays the effects of miserliness. His characters are taken from life, and are of great variety and interest. He is remorseless in his banter towards the failings and vices of humanity. He appealed from the pedants, the prudes, the *préteurs*, the snobs, to the Fr. people, and won his way to their

hearts. He has been attacked for a want of style, but his defence is that his language is that of his characters. The influence of Molière in comedy has been immense, greater by far than that of any other writer developing this particular branch. All subsequent Fr. writers of comedy derive directly from Molière. Neither was his influence less in England—as witness the works of Fielding and Sheridan—indeed one may almost say that for two centuries Molière's comedy has determined the form of European comedy.

Blaise Pascal (1623-62) was one of the foremost prose-writers of the seventeenth century, and in reading him we feel that we have at length arrived at modern Fr. prose. He was a member of Port-Royal, the stronghold of Jansenism (q.v.). His first work, *Les Provinciales* (1656) is a series of letters against the Jesuits. After his death were pub. his *Pensées*, the fragment of an *Apologie de la religion*. He closely follows Montaigne in observing the variety and uncertainty of human endeavour, but concludes that the sole refuge for thinking persons is in an absolute faith in God. Pascal shows deep penetration and draws pregnant conclusions from his observations, and brings his mathematical and scientific mind to the aid of religion. His works are a model of clear, refined prose. The seventeenth century also marked the zenith of the sermon. The three great preachers are Jacques Bénigne Bossuet, bishop of Meaux (1623-1704), Louis Bourdaloue (1632-1701), and Jean Baptiste Massillon, bishop of Clermont (1663-1742). Bossuet was celebrated for his funeral orations, notably that on the prince de Condé. He was great religious controversialist, and wrote *L'Histoire des variations des églises protestantes*, as well as combating the heresy of quietism. Another work from his pen is the *Discours sur l'histoire universelle*. Bourdaloue as a preacher was even more popular than Bossuet, while Massillon was also renowned for his harmony and elegance of style.

The increase of social intercourse called forth many works dealing with human manners and motives. Writers upon this subject are usually called moralists. The most celebrated moralist of the century was François la Rochefoucauld (1613-80), who pub. his *Mémoires* in 1662 and his *Maximes* in 1665. In the latter he tries to show all human actions to be inspired by self-interest and vanity. His style is terse and antithetical, but Jean de la Bruyère (1615-96) was less systematic than his predecessor; his *Caractères* (1688) show deep penetration and a considerable tinge of misanthropy. In some passages he speaks out with surprising vigour on behalf of the oppressed, thereby heralding the eighteenth century.

Of the great number of letter-writers of this period it suffices to mention Mme de Sévigné (1626-96), whose letters to her daughter, written in a sprightly and natural style, reveal to us not only her own emotions and sentiments, but the hist. of the period and the state of society and literature, and Mme de Maintenon (1635-

1719), second wife of Louis XIV., whose letters deal with the education of her young charges at St. Cyr. Memoir-writers are Mme de Motteville, who gives a simple and sympathetic account of the career of Anne of Austria, Cardinal de Retz, the historian of the Fronde, and St. Simon. The last named (1675-1755), misanthropical and disappointed as a courtier, has left an account of the court of Louis XIV., which is remarkable for the malignity of the portraits of his enemies. As a historian he is prejudiced and unreliable, but his descriptions are extremely vivid and his style eloquent and vivacious.

The novel of the seventeenth century was generally an affected tale of chivalrous adventure. Best remembered are Honoré d'Urfé's *L'Astree* (1627), a pastoral romance, and Mme de Scudéry's *Le Grand Cyrus* (1648).

The most typical Frenchman of the period was Jean Fontaine (1621-93). He pub. a book of *Contes* in 1661, and in 1668 the first six books of *Fables*. Though written at the height of the classical period these fables lack the restraint of classical literature. La Fontaine is the most *gaudious* of all his countrymen. His fables are little comedies, written in sprightly polymorphic verses, narrating episodes between various animals and full of penetrating reflections upon human life. His verse is often of lyric character. La Fontaine never preaches. The moral of the fables is so ingeniously conveyed that it at once strikes home. Probably no writer has added more catch-phrases to the stock of common Fr. speech than this admirable fabulist.

Nicholas Boileau (1637-1711) was the apostle of classicism. His work is mostly critical, and for more than a century his opinions were regarded as authoritative. In his *Satires littéraires* he entirely discredited the inferior writers of his time, and eulogised Corneille, Racine, and Molière. His prin. work, *L'Art poétique*, codifies the usage of the great writers, and holds it up as a model to be followed. He recognises no Fr. poet before Malherbe, and contributed largely to the high esteem in which Ronsard was held. He holds reason to be the guiding principle of real poetry. He recommends fidelity to nature—"Item n'est beau que le vrai. le vrai seul est aimable"—and the imitation of the ancients as the best method of high poetical achievement. In this he was opposed by the modernists, who, led by Charles Perrault, maintained that the age of Louis XIV. had surpassed the finest achievements of anct. classical literature. Both sides in the dispute showed lack of critical and historical judgment, but the modernists, though seemingly worsted, gained the day, and classical influence gradually waned. François Fénelon (1651-1715), archbishop of Cambrai, is well known as a prose writer. His *Education des Filles* (1689) gives excellent advice upon the upbringing of girls. His *Télémaque* (1699) is a didactic work, written for his refractory pupil, the duke of Burgundy, and conveying the fruits of Gk.

literature. His *Explication des maximes des saints* embroiled him with Bossuet and led to his disgrace.

In the eighteenth century Fr. literature freed itself from court influence. Louis XIV. d. in 1715, and after his death began the struggle against central authority that ended in the revolution. *Salons* became very powerful in forming public opinion. A change came over the Fr. mind. Religion, enfeebled by the controversies of the previous century, lost its hold, and abstract branches of knowledge, as metaphysics and morality, were abandoned for the study of social and political questions. Literature as such made no great advance, the originality of the age being shown more in historical, scientific, and sociological research. The two connecting links between the old and new centuries are Bernard Fontenelle (1657-1737) and Pierre Bayle (1647-1706). The former became the populariser of scientific knowledge in his *Entretiens sur la pluralité des mondes* and his *Eloges des Savants*. The latter was the precursor of the encyclopedists. His *Dictionnaire historique et critique* (1697) was one of the indispensable handbooks of the eighteenth century among those who led the life of religion. Charles Montesquieu (1689-1755) is the first great writer of the eighteenth century. His earliest work, *Lettres persanes* (1721), is a brilliant and piercing satire on Fr. society and institutions. His *Considérations sur les causes de la grandeur et de la décadence des Romains* (1731) is a work of real philosophic insight. *De l'esprit des lois* (1750) is an objective study of the various systems of legislature, a work no less stupendous in range than wanting in uniformity of plan, yet one of the most considerable works of the whole century. It is the sum total of his observations and reflections, with the deductions he drew from the facts and phenomena, historic, economic, and social, noted throughout his long life. Montesquieu is at once an inquirer and a reformer.

George Buffon (1707-88) wrote from 1749 till his death his *Histoire naturelle* and *Époques de la nature*. He had great descriptive powers, and was notable for his hypotheses, which anticipated later discoveries. His *Discours sur le style* (1753) is an eloquent expression of his opinion upon literary style.

The great name of the century is undoubtedly that of François Voltaire (1694-1778). Though his writings are not perhaps now widely read, his influence lives on. He was accepted by the world as the greatest man of his age, and his reputation was universal. He turned his attention to many branches of literature and stands high in them all. His poetical works include the *Henriade* (1736), an epic, and epistles, satires, and odes. He is sometimes happy in his light verse. His historical works are *Charles XII.* (1731), *La Siècle de Louis XIV.* (1751), and *Essai sur les Mœurs* (1744). His plays are modelled on Racine and Corneille. The prin. are (*Edipe* (1718), *Brutus* (1730), *Zaire* (1732), *Astree* (1736), and *Mérope* (1743).

By making use of a wider range of characters, scenery, and action he extended the scope of the classical drama. He also wrote short novels and stories, *Zadig* (1747), *Candide* (1759), *L'Ingénue* (1767), which served as a vehicle for social and political satires. Moreover, he left some 10,000 letters addressed to kings, princes, noblemen, and literary persons, which afford a wealth of information about this period. Though a believer in God he was violently opposed to all that did not agree with his religious opinions, and attacked the Church with a bitterness, keenness, and banter which did it lasting harm. He fought throughout his whole life against both gov. and eccles. oppression, and prepared the way for the revolution.

The *Encyclopédie* appeared from 1751 to 1772. Begun by Jean D'Alembert (c. 1717-83) it was taken up by Diderot, who enlisted the collaboration of many distinguished writers, and showed surprising versatility in his own contributions. Though the gov. attempted to hinder the work it was successfully pub., and contributed to the defence of political and intellectual liberty.

The theatre made little progress during the eighteenth century. Jolyot de Crébillon (1675-1762) wrote horrific but vigorous and immensely successful tragedies. Jean François Ducis (1733-1816) is noted for his trans. of Shakespeare, and Voltaire's plays have been mentioned above. Comedy was more favoured than tragedy. The Molière tradition was successfully continued by Jean François Regnard (1655-1709), Florent Dancourt (1661-1725), and Alain le Sage (1668-1747). The comedies of Pierre Marivaux (1688-1763) were of quite an original character, depicting the hesitant lover. His prin. plays are *Les Surprises de l'amour* (1722), *Le Jeu de l'amour et du hasard* (1731), *Le Jeu* (1736), and *Les Fausses confidences* (1737). His analysis of character is very delicate, and he excels in portraying woman. He has a keen appreciation of comic situations. In style he is subtle, delicate, and dramatic, and was imitated by successors whose "mariavaudage" developed into over-refinement and affectation. Pierre Beaumarchais (1732-99) is famous for two plays, *Le Barbier de Séville* (1773) and *Le Mariage de Figaro* (1784), which were great successes. They are full of taunts at the nobility, and reflected exactly contemporary feeling.

After Voltaire the most influential writer of the century was Jean Jacques Rousseau (1712-78), whose peculiarities at length developed into the mania of imaginary persecution. His first work, *Discours sur les sciences et les arts* (1749), endeavoured to show that human degeneracy was due to civilisation. His *Discours sur l'origine de l'inégalité parmi les hommes* (1751) is the first manifesto of Communism. *La Nouvelle Héloïse* (1759) is a portrait of wifely chastity which had an instant success. *Le Contrat social* (1762) is again a plea for communism. *Emile* (1762), written in favour of a more natural system of education, is perhaps

his *chef-d'œuvre*. His *Confessions* (1781-1788) is a remarkably open account of his life, including his weaknesses and faults, but is not entirely reliable. There are passages in which the author appears in a far from creditable light. Rousseau's daring and original thoughts upon society and its comparison with *L'Etat naturel* directly influenced the revolution. His style is mixed, sometimes heavy and dragging, sometimes rhetorical and declamatory, but he brought eloquence and effect once again into the language, after the sober reign of classicism. His splendid descriptions of nature and his outpourings of personal feeling are among the prin. sources of that flood of romanticism which was to rise in the following century. His chief literary disciple was Bernardin de St. Pierre (1737-1814), who wrote a charming book, *Paul et Virginie* (1789), a touching story of boy and girl love, full of splendid pictures of nature.

The best novelists of the eighteenth century were Alain le Sage, Pierre Marivaux, and the Abbé Prévost. Le Sage wrote two works, *Le Diable boiteux* (1707), an imitation from the Sp., and *Oïl Blas* (1715-35), an original novel whose scene is laid in Spain, and tells of the vicissitudes of a man of modest origin who reaches a high political position. It is long and complex, but true to life. Marivaux wrote the novels *La Vie de Marianne* (1731-41) and *Le Paysan parvenu* (1735-1736). They resemble his comedies mentioned above. L'Abbé Prévost is the author of *Manon Lescaut* (1732), a passionate love romance. He also trans. sev. Eng. novels.

Turning to lyric poetry we find it represented at the beginning of the century by Jean Baptiste Rousseau (1671-1741), who was held for some time to be the greatest Fr. lyrical poet. Ecouchard-Lebrun, nicknamed 'Lebrun Pindare', wrote odes after the style of Pindar, notably *Le Vengeur* (c. 1800). André Chénier (1762-94), an unfortunate victim of the revolution, wrote elegies, bucolics, and idylls, which are modelled upon the Gk., and breathe the very odour of classical charm. His metrical innovations, although copied from his models, led him to be claimed as the founder of the romantic school, but he is more closely allied to the Parnassians.

In the nineteenth century sev. important movements manifested themselves in Fr. literature, the enduring properties of which cannot yet be accurately appraised. The first is the Romantic movement, which took place between 1815 and 1850. The underlying principle of romanticism is the expression of individuality. The personal note predominates. Authors utter their emotions, aspirations, beliefs, and ideals. They break down the arbitrary barriers of form created by the classical school, and prefer to seek their inspiration in the N. literatures than in the exhausted fields of classical and S. Europe.

First of the romanticists is François Chateaubriand (1768-1848), whose works, *Aala* (1801), *Le Génie du christianisme* (1802), and *René* (1805), abound in vivid,

subjective, natural description, in religious feeling, and in melancholy. Mme de Staél (1768-1817) brought Shakespeare into the ken of the Fr. nation by her work *Littérature* (1800), and turned Fr. thought into a new channel by *L'Allemagne* (1810). Alphonse Lamartine (1790-1869) was the first romanticist to develop the lyrical strain of poetry. His poems, with their deep religious feeling and acquiescence in the divine will, were well in keeping with the mood of a nation just recovering from the strain of Napoleonism, and the sense of crushing defeat. With true lyrical faculty he nevertheless errs on the side of prolixity and facility. Victor Hugo (1802-85) has greater claims to be held as the chief of the romanticists. Though his inspiration was not of the deepest, it was extremely varied, and he knew well how to give it form. He broke down the rigidity of the Alexandrine, and made it of surprising richness. He used every variety of metre, and revelled in an inexhaustible vocabulary. His chief collections of poems are *Odes et ballades* (1826), *Les Orientales* (1829), *Les Feuilles d'automne* (1831), *Les Chants du Crépuscule* (1835), *Les Voix intérieures* (1837), *Les Contemplations* (1856); and *La Légende des siècles* (1877, 1883). Hugo's attempts to revolutionise the drama were not successful. *Cromwell* (1828), *Hernani* (1830), *Marion Delorme* (1831), and *Les Burgraves* (1843), all show his lack of dramatic and psychological invention. The characterisation is bizarre, the historical sense is unconvincing, but the poetry is magnificent. His novels, *Notre-Dame de Paris* (1831), *Les Misérables* (1862), and *Les Travailleurs de la mer* (1865), are too crowded and exuberant, though of great descriptive power. Alfred de Vigny (1797-1863) is a poet obsessed with morbid pessimism. He writes of the cruelty of nature and the indifference of God. His best poems are *La Colère de Samson*, *La Mort du loup*, and *La Bouteille à la mer*. His complete works were pub. in 1883-85.

Alfred de Musset (1810-57) has a great hold upon Fr. hearts. His poems tell of the regrets of love, and are impressively tender and sad. Best among them are *Les Nuits* (1833). His dramas rank high in the hist. of the Fr. stage. They are characterised by delicacy of feeling, and are written in a most lucid and charming style.

During the middle of the century arose the Parnassian school of poetry, whose leader, Théophile Gautier (1811-72), shrinking from what he regarded as the undue self-expression of the romanticists, formulated the doctrine of *l'art pour l'art*. Poems, like paintings or scenery, should appeal to our sense of beauty and not to our sympathies. Such a theory, if carried too far, leads necessarily to mere impersonality and frigidity. Gautier pub. his poems under the title of *Emeaux et camées* (1852), which well characterise the style of his work. His prin. followers were Leconte de Lisle (1820-94), José de Heredia (1842-1906), and Charles Baudelaire (1821-67). Sully Prudhomme (1839-1908) was at first also a Parnassian,

but did not remain so. He is the most philosophic of Fr. poets, and has a very clear and smooth style. François Coppée (1842-1908) was the singer of mean life. Paul Verlaine (1844-96), with Stéphane Mallarmé (1842-98), founded the symbolist school of poetry, suggestive, capricious, and at times obscure.

Hist. and literary criticism showed great virility in the nineteenth century. The prnf. critics were Abel Villemain (1790-1870), who inaugurated comparative and historical criticism, Augustin Sainte-Beuve (1804-69), author of *Port-Royal* (1840-60), *Portraits littéraires* (1844-52), and *Les Lundiés* (1850-60), and Hippolyte Taine (1828-93). The chief historical work of the last is *Origines de la France contemporaine*. Among historians the most celebrated are Augustin Thierry (1795-1856), whose theory of the rivalry of race is propounded in *La Conquête de l'Angleterre par les Normands* (1825) and *Le Tiers État* (1853). His most picturesque work is *Récits des temps mérovingiens* (1840). François Guizot (1787-1874) studied hist. in a philosophic spirit and paid special attention to it as a social science. Adolphe Thiers (1797-1877) is extremely well informed, industrious, exact, and clear. His two great works are *L'Histoire de la Révolution française* (1823-1827) and *L'Histoire du Consulat et de l'Empire* (1845-62). Jules Michelet (1798-1874) is distinguished by the poetical quality of his historical writings, which, however, gradually got the better of his historical judgment. His *Histoire de France* (1833-1868) thereby loses in value after the first 6 vols. Fustel de Coulanges (1830-89) is the greatest representative of the scientific method of treating hist. His method is to arrive at facts, collate them, and analyse them, leaving the conclusion to be drawn from the personality of the historian. Ernest Renan (1823-92) is the historian, though from the dogmatic point of view hostile historian, of the Christian religion. Educated for the priesthood, he abandoned it owing to inability to accept Christian dogmas. His *Vie de Jésus* (1863) (part of the *Histoire des origines du christianisme*) roused a great controversy, and is remarkable as an attempt by a sceptic to make a sympathetic study of Christ.

Of the writers of comedies Augustin Eugène Scribe (1791-1861) was the most prolific, producing some 100 pieces. He is an admirable constructor of plots and has a mordant wit. His best work is perhaps *Le Verré d'eau* (1840). Emile Angier (1820-89) distinguished himself as the defender of morality and the family. *Le Gendre de M. Poirier* (1854) is his best known comedy. Victorien Sardou (1831-1908) was a disciple of Scribe. Alexandre Dumas fils (1824-95) wrote paradoxical comedies, dealing chiefly with marriage and divorce. With Edmond Rostand (*Cyrano de Bergerac* and *Chantecler*) the comedy has again turned towards idealism and poetry.

As regards novelists, the names of Chateaubriand and Hugo have already been mentioned. George Sand (1804-76)

was a prolific female author, who wrote successively romantic, socialist, and pastoral novels, of which *Indiana* (1832), *Le Meunier d'Angibault* (1845), and *La Mare au diable* (1846) are respective types. Stendhal, whose real name was Henri Beyle (1783-1842), wrote novels of a psychological and realistic character, such as *Le Rouge et le noir* (1831) and *La Chartreuse de Parme* (1839). Honoré de Balzac (1799-1850) is the greatest of Fr. novelists. He is the most fertile creator of types, and excels in delineation of character. His collection of works is called *La Comédie humaine*, divided into *Scènes de la vie privée*, *Scènes de la vie de province*, *Scènes de la vie parisienne*, etc. His best works are *Eugénie Grandet* (1833) and *Le Père Goriot* (1834). Gustave Flaubert (1821-80) originated what is known as the realistic or naturalistic school by his *Mme Bovary* (1857), which was followed by a historical romance, *Salammbô* (1862), a story of Carthage. The greatest writer of the naturalist school was Émile Zola (1840-1900), whose style is sometimes tinged with vulgar brutality; yet robust; his is the power of the demagogue. His chief disciple was Guy de Maupassant (1850-93), who besides writing novels excelled in the short story. Alexandre Dumas père (1803-70) wrote romantic novels such as *Les Trois Mousquetaires* (1844) and *Le Comte de Monte-Cristo* (1841-45), which are of considerable interest. Prosper Mérimée (1803-1870) wrote nov. novels in sober and concise style, best known of which is *Colomba* (1840), the story of a Corsican vendetta. Jules (1830-70) and Edmond Goncourt (1822-96) wrote in collaboration. They are scrupulously exact in their observation. Alphonse Daudet (1840-1897) is a humorist whose best character is the celebrated *Tartarin of Tarascon*.

Summary of French Literature of the period of the Third Republic (1870-1940).—The period of the Third Empire (1870-1940) may be said to have derived its literary outlook and atmosphere from Mallarmé and Verlaine. For from these writers it derived its symbolism, its mistrust of the intellect and emotions, its belief in sensation unalloyed with intellectual processes. Also the best kind of Fr. literature, from Leconte de Lisle and Mallarmé to Marcel Proust (1871-1922) and Paul Valéry (1871-1944), had but little to do with politics; and in the domain of pure literature the Fr. nation during this disturbed period achieved much. One outstanding name in the period is that of Valéry who, in 1910, was the official poet of the Third Republic. From 1925 his pre-eminence is estab., and concurs with that of Proust and André Gide. None of the younger men, whose work was published before 1910, could really contest their supremacy. Parallel with this 'modern' line, Mallarmé—l'-roust-Valéry, run sev. other lines: thus the naturalism of the previous period is still in full tide, and Zola's influence remained unimpaired till his death in 1903 and afterwards; and indeed the magnetism of the Flaubert-Zola tradition is perhaps

the most obvious development in the whole hist. of the novel. Romanticism, if diminished, was still sometimes in evidence, notably in the work of Edmond Rostand (1868-1918), Mme de Noailles (1876-1933), and Romain Rolland (1866-1944). Jules Romains and Georges Duhamel reveal various kinds of art skillfully blended; while the infinitable Anatole France (1844-1924) and Charles Péguy (1873-1914) may be said to derive from Voltaire and Bossuet. When the Third Republic was sinking to its doom some younger men appeared 'in a shouting and heroic mood' (Prof. Denis Saurat), men like André Malraux, Louis Aragon, Henri de Montherlant, André Chamson, and Céline. Summing up the period Prof. Denis Saurat says: 'No absolute master of supreme genius appeared: no Hugo, no Balzac, no Molière. But at no time had the nation thought so much about art and literature, nor produced such quantities of very good art and literature, among, of course, much of inferior quality.' Paul Claudel represented in this period the important Catholic revival, he having been himself converted in 1886, whereas Mallarmé and the symbolists hesitated on the brink. Claudel early shed his positivist doctrines for an absolute orthodoxy free of the slightest scepticism or dubiety. His best poetry is moved simultaneously by the sexual and the spiritual impulse, and if his God seems somewhat cold and cosmic, the essence of the Claudelian dialectic is the part played by woman in frustrating or fulfilling His designs; and, in teaching the transfiguration of human love, Claudel is led from dichotomy to integration. This is illustrated by his play *Partage de Midi*, in which, as in *Antony and Cleopatra*, an adulterous love is transfigured by the approach of death. The failures of Catholicism became the subject of literary essays by Lucien Bley (1846-1917), Péguy and Georges Bernanos (1888-1948); but the most reliable critics deny that a single great work of art came out of the Catholic revival, for Jules Lemaître (1853-1911), Maurice Barrès (1862-1923), though Catholics in name, were really sceptics, while Charles Maurras and Ferdinand Brunetière (1849-1906) did not even make a pretence of believing. The deep movement was rather to be seen in Henri Bergson's (1859-1927) creative evolution towards true religious ideas, untempered by anti-clericalism, though the modern representative of the true Fr. tradition of Cartesian intellectualism is Octave Hamelin (d. 1907), for Bergson's criticism of the intellect is not in keeping with Fr. feeling. With the commercialisation of the novel came the limitations incidental to mass production and the search for popularity or suitability for immature minds. Among the best-sellers of the period in this kind we find René Bazin (1853-1932), Paul Bourget (1852-1935), Abel Hermant, and Marcel Prévost. None of these, however, could write with the brilliant objectivity of Pierre Loti (Vlaud) (1850-1927); and over all towered the figure of Anatole France, whose early novels were admirable

exercises in irony and compassion, the two moods that mark most of his work even to the last, *La Révolte des anges* (1914), the final masterpiece, in which love of justice and of liberty transcend the human piano (Saurat). Romain Rolland, who is nearer in spirit to Lamartine and Hugo than to his contemporaries, is important chiefly for one work, the 10-vol. novel *Jean Christophe* (1904-12), written as a direct reaction to Nietzsche's superman and ethic, and by way of an attempt to reconcile and unite France and Germany; but in this and in his plays on the Fr. Revolution his spiritual ego dominates the literary artist. It is true to say, however, that his work generally is a vindication of the deepest Fr. spirit, notably in the work *Charles Péguy* (1942).



AN ATOLL FRANCE

Among literary critics of the period may be named Emile Faguet (1817-1916), notable for his works on the seventeenth century; Ferdinand Brunetière (1849-1907), one-time master of the *Revue des Deux Mondes*, and a scientific materialist; Jules Lemaître; Rémy de Gourmont (1858-1915), whose criticism is warped by his democratic ideology, though he was the guiding spirit of *Le Mercure de France*; Charles Péguy, known for his great work on -almost by way of rehabilitation of- Victor Hugo; Léon Daudet (1867-1911), and Charles Maurras, who together produced *L'Action française* but whose political theories destroy much of value in their work. Maurras's writings reveal passion, but not sentiment, while much of his work has found very real inspiration in his love of Greece. Essayists of the period include Maurice Chartier Alain, who writes in the spirit of revolt against authority, as in *Mars ou la guerre jugée* (1921); Henri Bremond (1865-1939), whose *Histoire littéraire du sensément religieux* (1916) put a new complexion on the age of Louis XIV.; Jacques Maritain, whose *Art et sacerdoce* (1930) is a classic of erudition; and Julian

Benda, the critic of Bergson. Fr. novelists of the twentieth century are so varied in their outlook that they can hardly be classified, though there are some similarities in their ideas, and Proust has his imitators whether avowed or not, e.g. Montherlant. Duhamel and Romaine were estab. novelists in 1910, but only reached their best in 1930. Jules Romaine, primarily a poet of the *groupe de l'Abbaye*, is chiefly famous for his remarkable 27-vol. novel, *Les Hommes de bonne volonté* (1932 ff.), the great feature of which is its truly epic presentation of war. Duhamel seems to belong to the tradition of Balzac, Flaubert, and Zola. André Gide, the Chateaubriand of the twentieth century, is, however, by no means a type of the average Frenchman, began with a turgid romanticism disguised as symbolism; but his *L'Immoraliste* overdoes the anarchy of youth. But, as is shown by *Les Faux-monnayeurs* (1926), his only roman, he is a great stylist and a delight to read. Jules Supervielle is of the modern school, but whereas only pessimism characterises the thought of Proust, Gide, and Valéry, Supervielle represents all their modernist tendencies, but without their pessimism, as is illustrated in his *Le Forçat innocent* (1930). Pierre Hamp invented a new type of novel, the novel without a hero, but spun on an industrial theme, yet entirely human. Other names are those of Jean Richard Bloch; Eugène Montfort, who writes novels of the life in the vein of Zola, but still more pronounced; Joseph Rosny, whose stories are really allegories; Alain Fournier, whose chief note is fantasy; Roland Dorgelès; Paul Morand, who exploits the amoral mentality of post-war life; Jean Giraudoux (1882-1912), writer of fantastic dreams; Jean Schlumberger, whose *Saint-Saturnin* (1931), a picture of the *domaine* family life of Normandy, is one of the best novels of the time; Marcel Jouhandeu, subtle and sadistic in treatment; Jacques de Lacretelle; Georges Bernanos, known especially for his *L'Imposture* (1928), the portrait of the inner soul of an unbceiving priest; and François Mauriac, novelist of the Catholic bourgeoisie and of the Christian problems of the soul. He depicts powerfully the present-day neurosis in terms of the conflict between good and evil. See G. Lanson and H. Tiffreau, *Histoire de la littérature française* (deals with Proust, Gide, and Valéry), 1932.

There are two main currents in modern Fr. thought: existentialism (q.v.) and personalism, which form, as it were, the intellectual background to the great struggle between the forces contending for the soul of distracted France - Marxism and Christianity. The present fashion in existentialism is but the modern expression of a very old moral problem, as is shown in his *Traité du caractère* (1946), by Emmanuel Mounier, who proves that Socrates, Epicurus, St. Augustine, and Pascal had already faced the questions the existentialists are now asking. Nor is there anything especially Fr. in their concern with the existence of man; it is to

be found in the novels of Dostoevski, Kafka, Hemingway, and Steinbeck, among many others, all of whose works have a considerable vogue in France. Between existentialism and communism, affirming at once man's personal qualities, and his sense of community, we find Christianity and its philosophic expression in personalism. Among the outstanding leaders of Catholic thought are Père Henri de Lubac, whose *Drame de l'humanisme athée* (c. 1946) is a most penetrating analysis of the godless philosophies of the times, and Gabriel Marcel, who has given us a Christian expression of existentialism. The recent work of the Abbé Mouroux, *Sens chrétien de l'homme*, is a characteristic example of the efforts Catholics are making to commit themselves to the realities of their age, and to face the problems of the modern world. Thus all the chief tendencies of Fr. thought have two main characteristics: they are concerned with the drama of human existence and the need to face its problems, and their philosophic discussions no longer deal with abstractions, but in concrete living things. These tendencies are reflected in modern Fr. literature. It is a *littérature engagée*, expressing a sense of commitment to the reality of life as seen through a particular philosophic conception. Though not avowedly existentialist, it is in the main a philosophy of despair, such as finds expression in the drama of Jean Anouilh, novels like *Les Bonnes* by Genet or *Si le sôt s'affut* by René Reudel or the works of Sartre and Albert Camus. In his books *L'Univers concentrationnaire* (1946) and *Les Jours de notre mort* (1947) David Rousset describes, not an imaginary plague like Camus, but the real world of the concentration camps, sparing us none of the horrors, and writing with a complete absence of false pathos of the tortures and violence, and even the human grandeur he witnessed. Even in Fr. poetry we find a preoccupation with ideas — the revolutionary struggle with Aragon, mystic vision and spiritual meditation with Pierre Emmanuel and l'Autre de la Tour. Emmanuel, in his admirable spiritual autobiography, *Qui est cet homme?* (c. 1945), explains the problems of poetic creation and their relation to mystical experience. All the most significant works of the modern Fr. writers, Anouilh's *Antigone*, Sartre's *Huis clos* (1944), and Camus's *La Peste* (1947) come to the common conclusion that man is isolated and that he can do nothing to escape from his solitude.

The Théâtre Libre, directed by Antoine from 1887 to 1894, has had considerable influence on Fr. drama. Its main results were to bring new writers to the notice of the public and to foster naturalism in drama. François de Curel (1854-1928) is an important Fr. dramatist, many of whose plays were performed by the Théâtre Libre. Another theatre perhaps worth notice is Le Grand Guignol, which specialises in 'terror' plays. Verse plays, although not really popular, were considerably performed early in the twentieth

century, and since the First World War a play in free verse by François Porché met with great success. After 1918 there was in France, as in other countries, a flux of patriotic plays, but the only one of any real importance was *La Trumpe*, that was performed by the Théâtre Libre. The Théâtre du Vieux Colombier, founded in 1913 by Jacques Copeau, closed during the war, to be reopened in 1919. The plays performed by Copeau since the reopening of the theatre have been of simple construction, aiming at truth and natural comedy. Summing up the Fr. theatre Prof. Denis Saurat says that, despite his dreariness, Henri Beque is occasionally revived, but that 'François de Curel, Herriau, Brioux, Mirbeau, Bataille, Bernstein, Porto-Riche (*le Racine juif*) are now mere names, which will soon be forgotten.' Lavedan, Donnay, Capus, Courtelaine, Tristan Bernard, even Jules Renard, cannot fare much better, once their realism and their humour—very transient both—have evaporated. They really fall outside literary interests, and should be studied as a sociological phenomenon.' Some, if not most of the best modern Fr. poets—Valéry, Superville—and other writers—Gide, Cocteau, Claudel, Romain Rolland, and Giraudoux—have occasionally tried the drama, but with no greater success than a Byron or Browning.

See also BELGIUM, Literature; CRITICISM, LITERARY; PROVENÇAL LANGUAGE AND LITERATURE. For greater detail of Fr. drama see DRAMA.

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French Music, see FRANCE, Music.

French Oceania, Fr. is. settlements scattered over a wide area in the E. Pacific. They consist of the following is. or is. groups: Society Is., of which the most important are Tahiti (600 sq. m., pop. 25,000) and Moorea (50 sq. m., pop. 2250); their chief products are phosphate and copra. Leeward Is. (or Iles sous le Vent), the most important being Huahine Raita-tea and Tahaa and Bora-Bora Maupiti,

with a total pop. of 9500; Marquesas Is. (q.v.), area 480 sq. m., pop. 2400, the two largest is. being Nukahiva and Hiva-oa; the Tuamoto group, consisting of two parallel ranges of is. from King George's Is. on the N. to Gloucester Is. on the S., their total pop. being 5000; and the Gambier, Austral, and Rapa Is. Mangareva, the prin. is. of the Gambier, is 6 sq. m. in area, with pop. 1600. The total area of the Austral group is 115 sq. m., pop. 4000, the chief is. being Rurutu, Tabuai, Vavatu, and Makatea. The Rapa Is. lie far to the S. of the Austral. In 1944 the budget was 13,575,400 francs. Crops: coco-nut trees, covering 54,362 ac. Trade: 170,063 tons; value, 75,709,000 francs. Imports: 22,781 tons; value, 36,711,000 francs; exports, 117,288 tons; value, 39,968,000 francs. Navigation: 76 ships, 29,138 tons; value of goods, 311,710,000 francs. F. O. is administered by a governor with a privy council and a representative assembly of twenty members elected every four years. The Is. are represented in the National Assembly, the Council of the Republic, and the Assembly of the Fr. Union by one deputy each.

The earliest scientific exploration of the Pacific was that of La Pérouse, Capt. Cook's discoveries having inspired the Fr. Gov. to sponsor the voyage. In 1785 La Pérouse reached Australia but thereafter was lost. The Constituent Assembly sent d'Entrecasteaux to look for him, but without results; after visiting New Caledonia and sev. strings of is. round it, d'Entrecasteaux d. in the course of his expeditions. In 1823, during a cruise to Santa-Cruz, Dumont d'Urville learned that La Pérouse had perished there. Encouraged by the results obtained by Dumont d'Urville's voyage, Louis-Philippe decided to support Fr. missions in Oceania, which the Bourbon Restoration had created. These bands of fathers were struggling against the London Missionary Society, which had spread over all the ter. Thenceforward Fr. incursions became frequent, their avowed object being the protection of the Catholic missions in the E. Pacific ocean. Thus the Fr. estab. themselves in Tahiti, which Wallis, a Brit. subject, had explored before Bougainville (q.r.), who had preceded La Pérouse. It only became known later that Bougainville had taken possession of Tahiti for France and buried the authenticated deed in the ground. He named the is. New Cythera. It was in Tahiti that the Fr. friars were threatened with expulsion by Queen Pomare, who was encouraged by the energetic Eng. missionary, Pritchard. Adm. Dupetit-Thouars obtained the first agreement guaranteeing the safety of the Frenchmen on the is.; in 1843 he had to organise a new expedition to lay the foundations of a new protectorate and, in the end, had to proclaim the deposition of Queen Pomare (see further under TAHITI). The Fr. were, generally, unlucky in the Pacific. They left Hawaii at the suggestion of the U.S.A.; they gave up the Zulu Archipelago to Spain and New Zealand to England.

After a struggle which lasted for more than ten years, France retained only the Marquesas, Leeward Is., and the unimportant archipelago of Gambier. It has to be recognised that the Leeward Is. had been discovered by Cook (1769) and that Brit. missionaries had been estab. there. Only a century later, at the request of the natives, was the Fr. flag hoisted over these meagre possessions. Following the annexation of the Marquesas, Gambier, Society Is., Loyalty Is. (q.v.), and Clipper-ton, forty years later came that of Tuamoto, the Austral Is., and Rapa, which had been under Fr. protection, some since the time of Louis-Philippe and some since the Second Empire. See J. Stern (former Fr. minister of colonies), *The French Colonies Past and Future*, 1914.

French Revolution, see FRANCE, History.

French River, stream in Ontario, Canada; it empties Lake Nipissing into Lake Huron and enters Georgian Bay after a rapid course of 60 m.

French Shore, neutralised ter. between Capes St. John and Italy on the N.E. and W. coasts of Newfoundland, where the Fr. have the rights of fishing.

French Somaliland, see SOMALILAND; JIBUTI.

French Sudan, see SUDAN, FRANCH.

French West Africa, see FRENCH GUINEA, DAHOMEY, IVORY COAST, NIGER, SAHARA, SENEGAMBIA, WADAI.

French West Indies comprise the Is. of Martinique, Guadeloupe, Marie-Galante, Desirade, St. Bartholomew, and part of St. Martin in the lesser Antilles.

Freon, liquid compound known chemically as dichlorodifluoromethane, recently widely employed for the destruction of mosquitoes and other insects. For this purpose extract of pyrethrum flowers is dissolved in F. and the solution is used as a spray.

Frequency Modulation, see MODULATION.

Frere, Sir Henry Bartle Edward, first Baronet (1815-81), statesman, entered the Bombay civil service in 1834, and remained in India for thirty-three years, during which in various posts he rendered yeoman service to the country. During the mutiny he did invaluable work in connection with the relief of the Punjab, for which he was thanked by Parliament, and in 1859 appointed a member of the viceroy's council. Returning to England, 1867, he held various offices, and in 1877 was made governor of Cape Colony and high commissioner of S. Africa. Under his rule occurred the first Boer war and the struggle with Cetewayo. In 1880 he was recalled for having exceeded his instructions. He defended himself in *Afghanistan and South Africa*, 1881, and other publs. There is a biography by John Martineau, 1893.

Frere, John Hookham (1769-1816), Eng. diplomatist and author, son of John F., a distinguished antiquary. He was b. in Lond. and educated at Eton and Cambridge Univ. Served in the Foreign Office, and, subsequently entering Parliament, was made under-secretary. In 1800 he was envoy to Portugal; ambas. to Spain 1802-4 and again 1808-9. He

was a contributor to the *Anti Jacobin*, to Ellis's *Specimens of the Early English Poets* and to Southey's *Chronicle of the Sixty Years*. He also made some excellent trans from the plays of Aristophanes, but he is chiefly remembered for a burlesque poem on *Arthur at the Round Table*, purporting to be by Wm and Robert Whistlecraft Scholarship and wit characterize all his work. See also CANNING, GEORGE.

Freret, Nicolas (1688-1749) Fr scholar and historical critic b. in Paris. In 1714 he was admitted as pupil to the Académie des Inscriptions where he read his *dis course Sur l'origine des Francs*. For his novel opinions expressed in this work he was confined in the Bastille on a charge of libelling the monarchy. In 1716 he was made an associate of the Académie des Inscriptions and in 1742 perpetual secretary. Among his other works are a treatise on the origin of the Gauls, *Observations on the Cyropaedia of Xenophon* and *Historical Researches respecting the Ancient Peoples of Asia*, in which he explodes the theory of the fabulous antiquity of the Chinese.

Frere Town, or Kisumu, tn of Brit I Africa situated 2 m N E of Mombasa. It is important as the head quarters of the Church of England Missionary Society in Brit I Africa.

Frerets, see PRATICI III



GIROLAMO FRESCOBALDI

Frescobaldi, Girolamo (1583-1644) It organist and musical composer b. at Ferrara. He first gained a reputation as a singer but later was renowned for his organ music. He was organist of St Peter's Rome 1608-24 and again from 1633 to 1643. He was an excellent teacher and numbered J. J. Robberberg, the Ger. organist, among his pupils. His compositions include various forms of both instrumental and vocal music, his canzona and madrigals (a collection was pub at Antwerp in 1608) being especially noteworthy. See monographs by A

Sostegni 1929, L. Rouga 1930, and F Morol 1941.

Fresco Painting, process of mural painting on plaster which is still fresh (It *fresco*) or wet. It P is executed on a brick or stone wall which must first of all be perfectly dry. The plaster to be applied is composed of lime and water prepared a year before it is wanted and then mixed with sand at the time of using. See coatings of this preparation are applied but the first ones only the *arrivo* to half an inch thick to the entire wall at once. The two finer coatings the *intonaco*—are applied only to that portion of the wall which it is intended to paint in the day so that it may not be dry before receiving the pigments. The reason for this is that in the process of drying a crystal surface of carbonate of lime forms over the plaster and it is essential that the pigments should be there intact to receive this coating, for it is protective to them and gives them cleanness. When the painter has covered the portion of wall to be painted the painter superimposes his cartoon and pricks off the outline with an instrument of wood or bone, or makes an impression of it by pouncing. The cartoon is then removed and the colours are applied. The fresh plaster becomes thoroughly impregnated by them and they are thus incorporated with the rock or stone of lime and sand which constitutes the plaster and are therefore as enduring as the stone plaster if the process is properly carried out. The colours, which are principally earths or minerals for these best resist the chemical action of lime are ground up and mixed with pure water they should be thin and transparent and darker than required for in drying they become paler. From its nature it must be executed rapidly and it is often produced by single touches of the brush, therefore none but a master hand can exercise the craft with complete success. F P has sometimes been confused with the *en tempore* and *encaustic* methods of painting which probably preceded it. The date at which it came into use cannot be fixed, it belongs to remote antiquity. Colossal figures painted al fresco have been taken from ancient Egyptian palaces and temples and fragments have been recovered in Hierakonpolis and Kom Ombo which had lain for centuries beneath masses of earth and ruins. These had preserved all their original brightness of colour. The best exponents of the craft are Giotto, Masaccio, Filippino Lippi, Michelangelo, and Linus Luskin says that F P seems to have been practised at Verona in absolute perfection in the fifteenth century. Among modern italo-painters are Blandini and Delacroix in France, and Correggio, Overbeck, Von, and Schadow in Germany. The attempt in our own time to introduce F P in London has not been successful owing to the large quantities of sulphurous acid gas in the atmosphere. See J Ward *Fresco Painting*, 1909, A Elbmer *Entwicklung und Werksstofle der Wandmalerei*, 1926 and T Borenius, *Korentine Frescoes*, 1930.

Freshwater, par. and seaside resort in the Isle of Wight, England, 10 m. W. of Newport. The acreage of the par. is 4336, and it forms the W. extremity of the is.; the greater part of it is enclosed by the Freshwater R. It is noted for its interesting caves and as the residence of Tennyson during the latter years of his life. Pop. 4000.

Fresh-water Herring, see COREGONUS.

Fresnel, Augustin Jean (1788-1827), Fr. physicist, b. at Broglie (Norm.). He was an engineer of the Ecole des Ponts et Chaussees, and served in the dep'ts. of Vendee, Drôme, and Ille-et-Vilaine, but owing to his espousal of the Bourbon cause, lost his post on Napoleon's escape from Elba. Although he was reinstated he had turned his attention to physics in the interval. In 1819 he was appointed a commissioner of lighthouses, and was the first to construct the compound lenses instead of mirrors. His discoveries finally estab. the undulatory theory of light, which had first been advanced by Thomas Young. See D. F. G. Arago, H. de Séchamont, and others, *Œuvres complètes de Fresnel*, 1866-70.

Fresnes, tn., dept. Nord, France, 5 m. N.E. of Valenciennes. It has manuf's. of woollens, glass, and beet-sugar, and there are coal-mines in the neighbourhood. Pop. 6700.

Fresnillo, tn. in the state of Zacatecas, Mexico, 7700 ft. above sea level, at the foot of the Cerro del Proano, and 37 m. N.W. of the city of Zacatecas, there are rich silver mines and some copper, and large amalgam works. Pop. 24,600.

Fresno, city and co. seat of the co. of F., California, U.S.A., in the San Joaquin valley, and 162 m. S.E. of San Francisco. It is a rich farming dist., producing grains and fruit, especially Smyrna limes, and grapes for raisins and wine making. The chief industries are the preserving of fruits, lumbering, and mining; the F. petroleum field is one of the richest in the state. Pop. 60,700.

Fresnoy, Charles Alphonse du (1611-63), Fr. historical painter and writer, b. in Paris. His paintings show great correctness of design, and he was a good colourist, but his name is mainly remembered in connection with his writings, the chief of which *De arte graphica*, a Lat. poem, is a critical treatise on the practice of the art of painting.

Fretum Gallicum, see DOVIR, STRAIT OF.

Fretum Herculeum, see GIBELI PAR, STRAIT OF.

Fretwork or Fretsawing, art of cutting exterior and interior patterns in thin material such as wood, sheet metal, composition boards, plastics, etc. Designs in the last century were for intricate ornamental articles. To-day designs and plans are pub. for F. which are useful for the making of models, toys, etc., and for architectural planning. The prin. tool is a long-armed metal frame with handle for control and guidance. A 5-in. thin blade with about twenty teeth to the inch is held by a clamp between the arms. Rapid up-and-down motion causes the teeth to bite and cut and turn in a very

small space. Holes are made for the tiny sawblade to be threaded through and re-affixed in the frame in order that interior frets can be undertaken: a special tool called the archimedian drill has a fine bit for the purpose of boring the hole necessary for the insertion of the saw. Fretsaw blades vary in number of teeth and thickness of blade from fine to coarse; metal-cutting blades have a much larger number of teeth. Full-size design patterns provided are pasted to the cutting material, or copied out on it. After cutting is completed the parts are cleaned with glass-paper (emery paper for sheet metal) and put together to make the complete article. F. in wood incorporates designs for pipe racks, wool winders, cigarette delivery boxes, wall plaques, etc. Treadle machines follow the same principle of cutting and leave both hands free to manipulate the work on the cutting table. Heavier and more ambitious work is thus possible. The most modern machine is a bench machine fitted with a fractional h.p. motor, driven from the lighting circuit; this is suitable for the amateur, but heavier machines are provided for the commercial user. See W. F. Chambers, *All about Fretwork*, 1948.

Freud, Sigmund (1856-1939), prof. of neurology, Vienna Univ., famous as an exponent of psychoanalysis (q.v.). He was b. in Freiburg, Moravia, May 6, and educated at the Sperl Gymnasium, Vienna, and Salpetrière, Paris. His first serious studies moved from law to natural science. Later he worked under Brücke in the navy, Vienna, and in 1881 became assistant physician at the General Hospital. In 1885 F. became associated with Charcot, the Parisian neurologist, who taught that hysteria is of psychical origin and that ideas can produce physical changes, and F. returned to Vienna with his first inspiration to psychoanalysis. In 1895 he pub. with Breuer, *Studien über Hysterie*, outlining the theory that hysterical cases can be successfully treated while under hypnosis by freeing the pathogenic idea from the unconscious mind. He discovered later that the cure was not lasting, and abandoned hypnosis for suggestion. From this point he progressed rapidly with his studies and consequent discoveries in psychoanalysis, and pub. successively *Die Traumdeutung* (1900), *Psychopathologie des Alltagslebens*, (1901), and *Drei Abhandlungen zur Sexualtheorie* (1905). *Die Traumdeutung*, the significance of dreams, embodies some of his outstanding discoveries, among them the claim that the interpretation of dreams is an important factor in psychoanalysis, that the recollected parts of dreams are symbols of the activities of the unconscious mind during sleep when the will is ineffective and conscious self-control is suspended. In *Psychopathologie des Alltagslebens* the revolutionary nature of his theories aroused great hostility, and on many occasions his statements during lectures to doctors were met with open ridicule. Moreover, public interest was increasing (the Eng. trans. of this work alone ran into ed. after ed.), and

when he crystallised his theories in the assertion that nearly all cases of neurosis were due to the repression of sexual desires a storm of criticism burst upon him. He possessed, however, a personality of unusual strength, and proceeded unmoved. He claimed to have made a further discovery in 1898, when he stated that sexual desires begin at birth rather than puberty. Coming at a time when any frank exposition upon sexual problems shocked the public idea of morality, the claim aroused still fiercer attacks. Informed observers, however, found much to interest them in the consequent doctrine that a disturbance in a child's sexual growth explains all cases of mental subnormality, and that under proper direction sexual impulses may be "sublimated" into forces which can inspire the noblest achievements. Though he took great liberties with philosophy, and was himself a philosopher *malgré lui*, F. always wrote and spoke as a man of science. He did not claim to have invented his remarkable view of mental processes, but averred that he had merely discovered it. F. was a greater man than his detractors are prone to admit. His influence has permeated the world to such an extent that it may be discerned to-day in almost every branch of thought, and particularly in education, while some of his phrases have become part of everyday language, e.g. "inferiority complex." A *Times* reviewer writes that "the famous theory of dreams and the various "complexes" resolve themselves, when viewed as Freud meant them to be viewed, into observations of the activities of the "natural man" imprisoned and ignored yet always alive within us. This original sin, if denied, possesses, he believed, the power to "attach" itself to or "associate" itself with other, apparently good and innocent thoughts, lending them, thereby, its own passionate energy." Hence the innumerable "anxieties" and fears ("phobias") of the mentally sick; hence their strange apings of physical disease, their perverted ideas, their unreasoning prejudices. To resurrect this natural man and yoke his powers to fresh and useful enterprises was the life-aim of the physician (see also PSYCHOANALYSIS). His *Autobiographical Study*, trans. by J. Strachey, was pub. in 1936. In 1903 he founded the Vienna Psychoanalytical Circle, and by 1906 branches were estab. in other countries. In 1908 his influence spread rapidly, and the first International Psychoanalytical Congress was held at Salzburg, Switzerland. In 1909 F. visited the U.S.A. and delivered a course of lectures at Worcester Univ. On his return the International Psychoanalytical Association was formed with the dual object of regulating propaganda and preventing its prostitution by insincere practitioners. See H. Sachs, *Freud, Master and Friend*, 1945; and E. Ludwig, *Der entzauberter Freud*, 1946.

Freudenstadt, tn. of Württemberg, Germany, in the Black Forest, 30 m. S.E. by E. of Strasburg. It lies among the mts., and parts of its anc. walls are

still standing. It was founded in 1599 by Duke Friedrich of Württemberg for Protestant refugees from Austria. It possesses a peculiar triangular church. Manufs. are woolen goods, knives, and nails, and has shops for cabinet making, and spinning mills. Pop. 10,500.

Freund, Wilhelm (1806-94), Ger. philologist and lexicographer, b. at Kempen, Posen. He took an important part in the movement for the emancipation of the Prussian Jews, and was largely instrumental in the *Judengesetz* of 1847. His chief work is *Wörterbuch der lateinischen Sprache*, 1834-45, the chief basis of all subsequent Lat. dictionaries.

Frevent, tn. of France, in the dept. Pas-de-Calais, has manufs. of linen and woolen goods, and iron-works. Pop. 4800.

Frey, Friedrich Hermann, see GREIF, MARTIN.



High Commissioner for New Zealand
SIR BERNARD FREYBERG, V.C.

Freyberg, Sir Bernard Cyril, V.C. (b. 1890), Brit. soldier, b. in London; emigrated with his parents to New Zealand in 1892. Educated at Wellington College, New Zealand. Took part on Pancho Villa's side in the Mexican Revolution of 1914. Served with the Blood Battalion R.N.D. in the Dardanelles in 1915. Wounded nine times in the First World War in France, Belgium, and the Near E. V.C., 1916. Became at twenty-seven youngest brigadier in Brit. Army. Also awarded D.S.O. and two bars in that war. Major 1927, lieutenant-colonel 1929. Commanded 1st Battalion, Manchester

Regiment, 1929-31; colonel, 1931; assistant quartermaster general, S. Command, 1931-33; G.S.O. (1) at War Office, 1933-1934. Commanded Grenadier Guards and Queen's Royal W. Surrey Regiment. In Second World War he commanded the 2nd New Zealand Expeditionary Force, 1939. Appointed commander-in-chief of the Gk. and imperial forces in Crete, May 1941 (see CRETE, BATTLE OF). Appointed governor-general of New Zealand, 1946. There are interesting personal references to F. in Sir J. M. Barrie's St. Andrew's Univ. rectorial address, 'Courage' (1922).

Freyberg, see FREYBERG.

Freybourg, or Freyburg, canton of Switzerland, see FRIBOURG.

Freycinet, Charles Louis des Saules de (1828-1923), Fr. statistician, b. Nov. 14, at Foix; educated at Ecole Polytechnique, then entered gov. service as mining engineer. He was sent on a number of special scientific missions—among them one to England on which he wrote a notable *Mémoire sur le travail des femmes et des enfants dans les manufactures de l'Angleterre* (1867). On the estab. of the Third Republic in 1870 he offered his services to Gambetta, and was appointed prefect of the dept. of Tarn-et-Garonne; and in Oct. became chief of the military Cabinet. It was mainly his power of organisation that enabled Gambetta to raise army after army to oppose the invading Ger. He was a strategist of no mean order, but the policy of dictating operations to generals in the field was not attended by happy results. He entered the Senate in 1876 as a follower of Gambetta, but in Dec. 1877 became minister of public works in the Duflot Cabinet. In 1879 he became president of the council and minister for foreign affairs; and in 1886 he became Premier. In 1888 he became minister of war in the Floquet Cabinet, the first civilian since 1848 to hold that office. His services to France in this capacity were the crowning achievement of his life. In 1890 he was elected to the academy. In 1893 he resigned from the War Office, somewhat under the shadow of the Panama scandals. He pub. his *Souvenirs* in 2 vols. (1911-13).

Freycinet, Louis Claude de Saules de (1770-1842), Fr. navigator, b. at Montélimart (Drôme). In 1793 entered Fr. Navy; after taking part in sev. engagements against the Brit. he joined in 1800, with his brother, Louis Henri F. (1777-1840), who afterwards rose to the rank of admiral, the expedition sent out under Capt. Baudin in the *Naturaliste et Géographe* to explore the S. and S.W. coasts of Australia. Much of the ground covered by Flinders was revisited and new names composed by this expedition, which claimed credit for discoveries really made by the Eng. navigator. An inlet on the coast of W. Australia, in 26° S., is called Freycinet Estuary; and a cape near the extreme S.W. of the same coast bears the explorer's name. In 1805 he returned to Paris, and was entrusted by the gov. with the work of preparing maps and plans of the expedition; he also completed the narrative, and the whole work appeared

under the title of *Voyage de découvertes aux terres Australes, 1800-04* (1807-10). He also wrote *Voyage autour du monde, 1817-20* (1824-44).

Freyr, in Norse mythology, the god of the earth's fruitfulness, the giver of sunshine and rain, and all the fruits of the earth, and thus the source of all prosperity, the son of Njord. He was especially worshipped in the temple at Upsala in Sweden.

Freyre, Gilberto de Mello (b. 1900), Brazilian sociologist, b. at Recife (Pernambuco), Brazil. Educated by private tutors and at the Gilbreath Amor College in Recife. Was for a few years secretary to the governor of Pernambuco; then became prof. of sociology and social anthropology at the univ. of the Federal Dist. (Rio de Janeiro). He has been visiting prof. at Stanford, Columbia, and other Amer. univs.; but other commitments prevented him accepting invitations to become prof. of social philosophy at Yale in 1942, and prof. of Brazilian studies at Harvard in 1944. He is an honorary prof. on the faculty of philosophy of the univ. of Bahia. His great work, *Cusa-Grande and Senzala* (New York) (1933, 1936, 1938, 1943) has been trans. (by Samuel Putnam) as *The Masters and the Slaves* (1946). It is a brilliant study in the development of Brazilian civilisation and the masterpiece of Brazilian sociology, and indeed it may be regarded as the greatest sociological book that has been produced in Lat. America. It is a great book because of the brilliant conclusions F. draws from a mass of carefully related details, and for the way in which he brings to life whole generations of masters and slaves on the great plantations of N. Brazil. Other works: *Sobrados e Mucambos* (1936) (a continuation of the foregoing work); *Nordeste* (Northeast), 1937; *Um Engenheiro Francês no Brasil* (A French Engineer in Brazil) (1940); *Região e Tradição* (Region and Tradition) (1941); *Brazil: an Interpretation* (1945); and *Sociologia* (vols. I. and II.) (1945).

Freyzingen, Otto, see ORTO.

Freytag, Georg Wilhelm Friedrich (1788-1861), Ger. philologist, b. at Lüneburg. In 1819 he was appointed prof. of oriental languages at Bonn, a post he held until his death. He pub. *Darstellung der arabischen Verskunst*, a treatise on Arabic versification; *Hamasa carmina*; and *Arabum proverbia*; but his fame rests chiefly upon his *Lexicon Arabico-Latinum* (1830-37).

Freytag, Gustav (1816-95), Ger. novelist and dramatist, b. at Kreuzburg in Silesia. Attended Gymnasium at Oels, then studied philology at univs. of Breslau and Berlin. In 1838 he took his degree with a remarkable dissertation, *De initis poesies scenicae apud Germanos*. In 1839 he settled at Breslau as Privatdozent in Ger. language and literature, and devoted his attention to writing for the stage. He achieved success with his comedy, *Die Brautfahrt, oder Künste von der Rosen*, in 1844. This was followed by a vol. of unimportant poems, *In Breslau*

(1845), and the dramas *Die Valentine* (1846) and *Graf Waldemar* (1847). He attained a prominent position by his comedy, *Die Journalisten* (1854), one of the finest Ger. comedies of the nineteenth century. In 1847 he migrated to Berlin, and the next year he took over, with Julian Schmidt, the editorship of *Die Grenzboten*, a weekly jour. which, founded in 1841, now became the leading organ of Ger. and Austrian Liberalism. F. helped to conduct it till 1861, and again from 1867 till 1870, when, for a short time, he ed. the new periodical *Om neuen Reich*. His literary fame became universal in 1855 by the pub. of his novel *Soll und Haben*. This was trans. into almost all the languages of Europe. It was undoubtedly the best Ger. novel of its day. It was impressive by its sturdy realism, and it was in many parts very humorous. The main purpose of the novel was to show that the Ger. middle class was the soundest element of the nation. But it had a more directly patriotic intention, in the contrast which it draws between the reputed homely virtues of the Teuton, the shiftlessness of the Pole, and the rapacity of the Jew—views which the Gers. still hold to this day. As a Silesian, F. has no love for his Slavonic neighbours, and being a native of a prov. which owed everything to Prussia, he was naturally an earnest champion of Prussian hegemony over Germany. His powerful advocacy of this idea in his *Grenzboten* gained for him the friendship of the duke of Saxe-Coburg-Gotha, whose neighbour he had become on acquiring the estate of Siebleben near Gotha. At the duke's request, F. was attached to the staff of the crown prince of Prussia in the campaign of 1870, and was present at the battles of Worth and Sedan. Before this he had pub. another novel, *Die verlorene Handchrift* (1864), in which he endeavoured to do for Ger. univ. life what in *Soll und Haben* he had done for commercial life. The hero is a young Ger. prof., who is so wrapped up in his search for a MS. by Tacitus that he is oblivious of an impending tragedy in his domestic life. This book was, however, not so successful as its predecessor. Between 1859 and 1862 F. pub. in 5 vols. *Bilder aus der deutschen Vergangenheit*, a valuable work on popular lines, illustrating the hist. and manners of Germany. In 1872 he began a work with a similar patriotic purpose, *Die Ahnen*, a series of historical romances, in which he unfolds the hist. of a Ger. family from the earliest times to the middle of the nineteenth century. This series comprises the following novels, none of which, however, reaches the level of his earlier works: *Jago und Ingraban* (1872); *Das Nest der Zaunkönige* (1874); *Die Brüder vom deutschen Hause* (1875); *Marcus König* (1876); *Die Geschwister* (1878); and *Aus einer kleinen Stadt* (1880). Among F.'s other works may be noticed *Die Technik des Dramas* (1863); an excellent biography of the Baden statesman, Karl Mathy (1869); an autobiography, *Erinnerungen aus meinem Leben* (1887); and his *Gesammelte Aufsätze*, chiefly

reprinted from *Die Grenzboten* (1877–78). See monographs by H. Lindau, 1907; J. Hoffmann, 1922; and R. Koehner, 1926.

Friar (from Lat. *frater*, brother), Eng. name given to the members of the various mendicant religious orders, the chief of which were the Franciscans or Minors (Grey Frs.), the Dominicans or Preachers (Black Frs.), the Carmelites (White Frs.), and the Austin Frs. or Hermits. Besides these there were the Trinity or Red Frs., and the Crutched or Crossed Frs. The name has also been applied to individual members of the orders as a title, e.g. Friar Lawrence in *Romeo and Juliet*.

Friars Minor, see FRANCISCANS.

Friar's Balsam, Wound Balsam, or Jesuit's Drops, compound tincture of benzoin which is prepared by macerating benzoin with storax, tolu, and aloes in rectified spirit. It is used in the preparation of soups and washes, as a medicine, and as a protective coating for wounds.

Friar's Crag, beauty spot in Cumberland, England, consisting of a rocky promontory on the N.E. shore of Lake Derwentwater. It is owned by the National Trust.

Fribourg, Freiburg, Freybourg, or Freyburg, Swiss canton, situated in the S.W. of the country with a tn. of the same name. The surface is hilly, the highest point being 7858 ft., and the chief rive. are the Brolo and the Sarine. Two-thirds of the inhab. speak Fr., and are almost entirely Rom. Catholic. It is essentially an agric. and pastoral canton, and is famous for its cheese (Gruyère) and cattle. Timber and peat are also important products, and there are manufs. of straw hats, watches, and chocolate at Broc. The tn. of F. (Fribourg en Nutoune), on the R. Sarine, is about 20 m. from Berne, and is the cap. of the canton. It is the seat of the bishop of Lausanne, and manufs. sewing-machines, agric. instruments, and fertilisers. The prin. building is the collegiate church of St. Nicholas, with nave dating back to the thirteenth century, a fifteenth-century bell-tower, 250 ft. high, and an organ with about 7900 pipes. Pop. (canton) 152,000, (town) 26,000 (1911).

Frick, Wilhelm (1877–1946), Ger. statesman, b.-at Alsenz; educated at Munich, Gottingen, and Berlin Univs. Took part in National Socialist putsch in Munich, 1923. Member of Reichstag, and head of the National Socialist section of the Socialist party, 1924. He was the first National Socialist to become a minister, being appointed minister of the interior in Thuringia, 1930. Reich minister of the interior in Hitler's Cabinet in 1933. Prussian minister of the interior, 1934. F. was largely responsible for bringing the Ger. nation under the complete control of the National Socialist party; in large part he was responsible for legislation to suppress the trade unions, the press, and the Jews. He also knew of the atrocities committed in the concentration camps and, by implication, approved of them. As a former protector of Bohemia-Moravia he was guilty of further atrocities. He was among those major war criminals tried and executed at Nuremberg (see

NUREMBERG TRIAL, being found guilty on two counts—preparing a war of aggression, and committing war crimes and crimes against humanity. Publs. included *Die Nationalsozialisten im Reichstag 1926-31* (1932); *Ein Reich* (1934); and *Freiheit und Bindung der Selbsterwaltung* (1937).

Friction (from Lat. *fricare*, to rub), resistance to motion occasioned by the fact that two bodies are in contact, or, more correctly, the tangential force that opposes the motion of one body over another. If a book (say) rests on a horizontal table the weight of the book is balanced by an equal and opposite force which the table exerts on the book. Both these forces act along lines normal to the surface of the table, and the force on the book is called the normal reaction. The normal reaction can be increased by placing a load, such as another book, on top of the first. If the book is now pushed gently from one end no motion occurs, and some other force must therefore be acting on the book to prevent it moving. This force is called the force of F., and since it just balances the push applied to the book, and this is parallel to the surface of contact between book and table, the F. also must act in a direction tan. θ to the same surface. If the push applied to the book is slightly increased no motion occurs, so the F. must also increase, and to just the extent required to keep the book stationary. When the applied push is steadily increased, however, a value is reached sufficient to cause the book to move, so there is a maximum force that the F. can assume. This is called the limiting force of static F., and its value depends upon the normal reaction, as well as upon such factors as the roughness of the surfaces of book and table, and the natures of the materials of which they are composed. The limiting force of static F. depends little or not at all upon the areas of the surfaces in contact, but for dry surfaces and within certain limits of loading, varies directly as the normal reaction, so that the ratio F./normal reaction is a constant typical of the materials in contact and their roughnesses; this ratio is called the coefficient of static F. For most dry and fairly smooth surfaces its value lies in the range 0.15 to 0.6.

If the book is kept in steady motion along the table the F. opposing motion is called the kinetic F., and its value is found to be somewhat lower than the limiting force of static F. The ratio of kinetic F. to normal reaction is also constant, and practically independent both of the area of the surfaces in contact and of the speed of motion, and is called the coefficient of kinetic F. The above facts may be better appreciated if the following simple experiment is performed. A long, uniform rod is balanced on the outstretched forefingers of the experimenter, a greater length of the rod being allowed to overhang at one end than at the other, and the two hands are brought closer together until the forefingers are in contact. The explanation of what happens is left to the reader.

More refined experiments than those described show that when one body slides slowly over the surface of another there is often a tendency for motion to occur in a series of short movements with intervals of rest between them, for example, by alternate slipping and sticking. The origin of the force of F. is still a matter of debate. It has been suggested that the resistance to motion arises because tiny protuberances of one surface interlock with those of the other, so that slipping can only occur if these projecting parts become sheared off, or if one is lifted over the other. There is much evidence, however, to show that during sliding the heat generated at small local areas may be sufficient to raise the temp. there to a value sufficient to melt one of the solids, so that the sliding may involve alternate welding of the surfaces together; and disruption of the welded junctions.

When it is necessary to reduce F. to a minimum, as in the moving parts of machinery, it is usual to lubricate the surfaces which are to slide over one another. This means that a film of liquid is kept between the solid surfaces, and holds them apart except when they have been left stationary for some time. Since the film of liquid is maintained by the continual dragging of fresh liquid into the required position by the moving solids, the liquid must be one that adheres well to the bearing surfaces. It must also have a suitable viscosity; that is, it must not be so mobile that it is readily forced out from between the solids and yet should not be so highly viscous as to resist the motion more than is necessary. With lubricated surfaces the F. is nearly independent of the normal reaction, but varies directly as the area of the sliding surfaces, and increases with increase of the speed of motion. Another way of reducing the effects of F. is to replace sliding by rolling, as is done by using wheels on vehicles, or ball or roller bearings in machinery.

Friday (A.-S. *frige daeg*, being a trans. of the Rom. name of this day, *dies veneris*), sixth day of the week, *cu* i the Muslim Sabbath. It is regarded as a fast day throughout the year by both E. and W. Churches (unless Christmas Day occurs on a F.) in memory of the Passion, which is commemorated annually on Good F. According to the Moslems F. was the day Adam was created and received into paradise, the day on which he was expelled from it, the day on which he repented, and the day on which he died, and it will be the day of the general resurrection.

Frideswide, or Fredeswitha, St. (d. c. 735), patroness of Oxford, the daughter of the ealdorman *Didra*. She refused marriage with a Mercian noble, *Algar*, choosing rather religious life. She was canonised in 1481.

Fridolin, sometimes called Tridolin, or Trudelin, sixth-century Irish saint and patron saint of Glarus in Switzerland. He established a church on Säckingen Is., in the Rhine, and is known as 'the first apostle to Allemannia.'

Friedberg: 1. Tn. of Hesse, Germany, situated 17 m. from Frankfurt. Noted

for manuf. of sugar, gloves, leather, and photographic chemicals. Pop. 12,900. 2. Small tn. in Upper Bavaria, with an old castle, about 4 m. from Augsburg. Pop. 4600.

Friedeburg, Hans von (*d.* 1945), Ger. admiral or 'admiral-general.' Was second in command of the U-boat fleet early in the Second World War. On the promotion of his chief, Adm. Dönitz, to commander-in-chief of the Ger. Navy in Jan. 1943, superseding Adm. Raeder, F. became commander-in-chief of the U-boat fleet. When Dönitz proclaimed the death of Hitler and his own succession as *Führer*, F. appears to have been again promoted into Dönitz's former position. He emerged as commander-in-chief of the navy in the closing days of the war, and signed at Itheims the instrument of Germany's unconditional surrender in that capacity. A fortnight later he was taken into custody with other members of the Ger. high command in Flensburg, but at once committed suicide.

Friedland: 1. Tn. of Bohemia, Czechoslovakia, about 12 m. from Reichenberg. It is noted for its manuf. of woollen and linen cloth, but besides this has an old castle formerly owned by Wallenstein. Pop. 7000. 2. Tn. of the R.S.F.S.R. (formerly E. Prussia), on the Alle, 28 m. S.W. from Kaliningrad (Königsberg). It was the scene of the defeat of the allied Russians and Prussians by Napoleon in 1807. Pop. 3000.

Friedrich Wilhelm Victor Albert, see WILLIAM II.

Friedrich Wilhelm Victor August Ernst, (*b.* 1882), last of the crown princes of Prussia and princes imperial of Germany, was *b.* May 6 in the Marble Palace, Potsdam; eldest son of him who became Kaiser Wilhelm II. He entered the cadet school at Plon, April 1896. In 1901 he matriculated at Bonn. In 1903 he visited S. and E. Europe. On June 6, 1905, he married Cecilie, duchess of Mecklenburg (*b.* 1886), by whom he has had four sons and two daughters. In Jan. 1906 he was placed in command of the Leib-Eskadron of the Garde du Corps. From 1907 he studied at the Institute of Technology, Charlottenburg. He was frequently in England, and often conversed with Edward VII. In 1909 he travelled in India, visiting Russia before his return to Germany, where he was then placed in command of the 1st Life Hussars at Langfuhr by Danzig. He joined in the condemnation of Bethmann-Hollweg's weakness concerning Agadir (1911), and he took the army side in the Zabern affair of Nov. 1913, whereupon the Kaiser deprived him of his command. He commanded the Fifth Army at the beginning of the First World War, and in Sept. 1915 was (at least nominally) in command of the forces attacking Verdun. At the conclusion of the war he fled to Holland, where he occupied the parsonage on the Is. of Wieringen until Nov. 10, 1923. He resumed residence at his palace of Oels, Silesia, on the 13th; and, as he undertook not to meddle in politics, he was left there undisturbed. He pub. *Aus meinem Jagd-*

tagebuch (1912); *Erinnerungen des Kronprinzen Wilhelm* (1922); *Ich suche die Wahrheit* (1922), and *Meine Erinnerungen aus Deutschlands Heldenkampf* (1923).

Friedrichroda, tn. and popular summer resort of Germany near Gotha in the Thuringian forest. The ducal hunting seat of Reinhardtsbrunn, built on the site of the Benedictine monastery (1085), is in the vicinity. Pop. 3500.

Friedrichsdorf, tn. in Hessen-Nassau, Germany, 3 m. N.E. of Homberg, on the slopes of the Taunus hills. Dye-works, tanneries, weaving, and tobacco are its chief industries. Founded by Hugoenot refugees in 1687. Pop. 1800.

Friedrichshafen, tn. of Württemberg, Germany, on the E. shore of Lake Constance. The tn. is a favourite tourist resort. It was formed by Frederick I., who amalgamated the former imperial tn. of Buchhorn and the vll. of Hofen. Before the Second World War it had machine shops, boat-building yards, and manufactured leather, etc. N. of the station were the Zeppelin works, erected by public subscription in 1908. The ground floor contained the Zeppelin museum, with exhibits showing airship development. In 1924 the LZ126 flew from here to America. She was transferred to the Amer. Air Service in accordance with the treaty of Versailles, and named the *Los Angeles*. The Graf Zeppelin was constructed here in Oct. 1928, and flew to America, remaining aloft 112 hrs. F. was frequently and heavily bombed by the R.A.F. during the Second World War, including an attack on Germany's largest radio-location factory. Pop. 15,700.

Friedrichsruh, vll. in Schleswig-Holstein, Germany, 13 m. from Hamburg. It contains the mausoleum of Prince Bismarck, who *d.* in 1898.

Friendly Islands, see TONGA ISLANDS PROTECTORATE.

Friendly Societies. Despite occasional periods of financial instability, through which some of the smaller societies have passed, the social utility accruing from the almost universal institution of F. S. cannot be doubted. The participation in mutual advantages, on as sound an actuarial basis as small contributions will allow, combines the best principles of economy and collectivism, and the recognition of these facts may be said to have induced the State, almost from the earliest days of F. S., to render them assistance, especially by way of relief from taxation or other public burdens, and, ultimately, to recognise their elements of permanent value by adopting them as an integral part of the great scheme of insurance of 1911.

Voluntary associations for such purposes as the maintenance of members in sickness, old age, and poverty have existed even from early in the seventeenth century, and it is generally assumed that the genesis of the friendly society is to be sought in the burial club, an institution of a quasi-religious character. But the more complex organisations of to-day are by no means referable to any spontaneous creation, and are rather the outcome of a general social development. The more

concrete expression of their nature, purposes, and the different classes into which they may be divided, is due to legislative interference by way of regularisation and co-ordination.

Doubtless F. S. may be formed for almost any purpose of a philanthropic or charitable nature, but a more restricted classification of objects is to be gathered from the Consolidating Act of 1876, which enumerates the kinds of societies which may be registered as F. S. under the Act. The purposes of such societies as the Act specifically designates F. S. include the relief or maintenance of the members, their husbands, wives, children, or other relatives in sickness or other infirmity and old age; payment of burial expenses; insurances on birth of children; and relief in case of unemployment, shipwreck or other circumstances of distress; endowment insurance and insurance against fire of tools or implements to any amount not exceeding £15. Other classes of societies regulated by the Act are 'benevolent societies' for any benevolent or charitable purpose; 'working-men's clubs' to promote social intercourse, mental and moral improvement, and recreation; and 'specially authorised societies,' or 'societies whose purposes justify the exception to them by the Treasury of the provisions of the Act. The report of the royal commission of 1870 divided registered F. S. into thirteen classes, and gave them a nomenclature which has not found statutory expression. But the div., though only popular, brings out the distinctive characteristics of the various kinds of societies. Affiliated societies, like the great Manchester Unity of Oddfellows, the Order of Druids (*see under Druids, ANCIENT ORDER OF*), and the Order of Foresters (*a.r.*) are those consisting of one central body and a number of independent branches variously called lodges, tents, or divs. Most of the lodges in existence before 1875 are now registered, but a society having a fund under the control of a central body, to which every branch must contribute, may be registered as a single society.

Two other important classes are the 'collecting' and 'dividing' societies. The former, which were so named from the fact that contributions were paid to collectors who went from house to house, were strongly abominated on by the commission by reason of the undue proportion of expenses of management to the total contributions. They are societies whose membership is composed essentially of persons of the lower social strata, who from one cause or another are, or were, unable to check mismanagement by the collectors and other officers of the society. But as against this, the commissioners conceded that the benefits of life assurance were extended to a class of persons who could not have been prevailed upon to insure except by such personal canvassing. These societies, as above indicated, are dealt with in the Consolidating Act, the Collecting Societies and Industrial Assurance Companies Act, 1896. Under this Act members must be supplied

with a copy of the rules and a printed policy for a sum not exceeding one penny each. Default in payment of a contribution is not to cause forfeiture or a lapsed policy until continued default for fourteen days after written notice to the member of the amount due. Collectors may not be members of the committee nor hold any other office in the society or vote at meetings. Dividing societies are those which levy somewhat higher average contributions, and every Christmas time divide or 'share out' the surplus remaining after payment of sick allowances during the year. The above Act, as amended in 1908, regulates all F. S. (including 'Orders with various branches; Benefit Societies; Deposit Societies and Collecting Societies'). Since that date, the work of the societies has expanded despite the growth of state relief, and although affiliation has reduced the actual number of societies, membership continued to increase. Most societies are, of course, approved societies for National Health Insurance purposes. In 1938 there were over 19,600 societies on the register of F. S., with a total membership of 8,491,000, and possessing total funds amounting to £151,613,000. There were also 119 collecting societies, with 25,738 assurances or policies and total funds of £84,837,000. During 1938 F. S. proper paid out about £5,400,000 in sickness benefit and £1,600,000 in death benefit, while payments of claims on death by collecting societies amounted to about £1,600,000.

A friendly society must consist of at least seven members in order to be registered. The advantages of registry are (1) Exemption from penalties under any of the provisions of the Unlawful Societies Act, 1744, and Seditions Meetings Act, 1817, so long as the business and meetings do not go outside the registered rules. The result is that a registered society may, but an unregistered society may not, require any unauthorised test or declaration from its members without incurring a penalty; (2) exemption from stamp duties; (3) power to obtain transfers of stock standing in the name of trustees by order of the chief registrar when the trustees are absent, dead, or otherwise incapable of making the transfer; (3) preferential rights over other creditors in the death or bankruptcy of officers of the society; (4) power to admit minors as members from the date of birth; (5) power to make loans to members or subscribe to the funds of any hospital, infirmary, charitable, or provident institution such sum as may be necessary to secure to members of the society or their families the benefits of such hospital or other institution; (6) power to invest in savings banks or with the National Debt Commissioners; (7) reduction of rates on death certificates; (8) officers of the society may be compelled to give security for the rendering of proper accounts and to account for and deliver up the property in their hands; and (9) power to proceed summarily against any one misappropriating the society's property. Every registered society must have a registered office, appoint trustees,

audit its accounts, send ann. returns to the registrar, make a quinquennial valuation of its assets and liabilities, and keep copies of balance sheets and valuations hung up in a conspicuous place in its registered office. Under a registered society an individual member's rights are better safeguarded than in the case of an unregistered society. He is entitled to inspect the books, have copies of the ann. return, and a copy of the rules on payment of not more than one shilling. In a registered society the limitation of an individual member's benefits, whether he belongs to one or more societies, is a gross sum of £300, not including bonuses, or an annuity of £52. Surplus contributions of members, after payment of any assurance money, may be accumulated at interest. A member of a registered friendly society (other than a benevolent society or working-men's club) may dispose of any sum not exceeding £100 payable on his death by nominating any person he chooses to whom the money shall be paid at his decease. A registered society may invest its funds in any of the funds in which trustees generally are authorised to invest, or in a savings bank, or the public funds, or in the purchase of land, or in any other non-personal security where expressly authorised by its rules.

A friendly society may be dissolved either voluntarily or compulsorily. In the former case, the consent of five-sixths in value of the members, including honorary members, and of all in receipt of any relief, annuity or benefit, is necessary, unless their claims are provided for. In the case of an insolvent society, one-fifth in number of the members may apply to the registrar for a compulsory dissolution, and the registrar may make an award to that effect if on investigation that seems the best course.

F. S. were classified under two headings by the Industrial Assurance Act of 1923, as Life Assurance Societies and Collecting Societies, and changes were made in the control of these bodies. The most important of these was the appointment of a commissioner of F. S., in whom are vested very great powers of control, and against whose decision it is only possible to appeal to the high court. The commissioner can demand to be satisfied on financial and other subjects, and may return or refuse to pass balance sheets and other accounts, and can dissolve a society that defaults or fails to carry out its legal obligations. He has also the power to exempt bodies from the requirements of the Acts and is the authority to settle disputes, thus taking the place previously held by the Board of Trade. The Acts of 1923 and 1924 slightly varied the existent law on the insurance of children by making the limit for which a child can be insured £5 up to three years of age, £10 up to six years of age, and £15 up to 10 years of age, but this alteration was in view of the slightly changed purchasing power of money. The old principle was maintained that no child should be insured for a larger sum than the cost of a funeral. In this and subsequent Acts powers were given for

insurance in cases where the decease of the insured person might involve a liability on the insurer. The Acts of 1923, 1924, and 1929 made it an offence to issue illegal life policies. Up till this change, premiums were frequently paid where there was no insurable interest, and thus money lost to the insurer. In the new Acts it was provided that such a policy, issued in error, was to have a value bearing relation to the amount that had been paid, and this amount could be claimed in cash or as a paid-up policy.

War legislation affecting F. S. and their members' rights included the Industrial Assurance and Friendly Societies (Emergency Protection from Forfeiture) Act, 1940, which applies to any policy of life assurance (where there is a separate contribution) for a sum assured not over £50 (excluding bonuses), in force immediately before Sept. 1, 1939, subject to not less than two years' contributions having been paid. This Act prevents the lapsing of such assurances where failure to pay contributions was due to circumstances arising out of the war. The Societies (Miscellaneous Provisions) Act, 1940, enabled the chief registrar to give directions to authorise the suspension of meetings, appointment of officers, and the meeting or amendment of rules by the management committee of societies. The Act also empowered societies to set up a fund for the purchase, on behalf of their members, of national savings certificates, defence bonds, and such other securities as may be presented. Furthermore, the Act gave protection to members serving in the forces whereby they should not be deprived of their membership by reason of their discontinuance of the payment of their contributions whilst serving, and whilst benefit might be suspended until such time as the member resumed his contributions within three months of determination of his service (or of the emergency period), upon resuming contributions the member was to be placed in the same position as to future benefits as he would have been had he not ceased to pay his contributions. But the Act did not preclude societies from granting to their serving members better terms than the minimum statutory protection.

There can be no doubt that members of F. S. benefited financially by the first National Insurance Act, although in the course of previous legislation they were, on the whole, gradually adopting a more scientific financial policy. It is probable that the new comprehensive National Insurance scheme when in full operation—with its increased contributions to provide the 'cradle to the grave' benefits on a scale beyond any 1912 conception—will have repercussions on the voluntary F. S., but only time will show the extent of its effect on the numerical strength and potential income of these societies, with their various systems of sickness insurance and combined benefit tables based on a wide range of contributions scaled according to age and the extent and nature of the benefits provided. Since the insurance scheme of 1912 was introduced the volun-

tary societies have continued to grow in the face of keen competition, but their great expansion has naturally brought many societies to the point where they have already found it difficult to maintain a sufficient influx of new young entrants to replace membership losses due to death and other causes. As to how far the general body of members comprising the F. S. movement can afford to continue their voluntary insurances along with their higher State scheme contributions in future, it must be borne in mind that present day wage levels are appreciably higher for all classes of workers than in 1912, and the gov. has declared that continued voluntary insurance to supplement State benefits, wherever one's means permit, should be encouraged. In most societies the rules provide for (a) contributions at a uniform rate for all ages, together with an entrance fee varying according to the age of the entrant; or (b) periodical contribution at a rate varying with the age at entry. There are F. S. in many of the Brit. Dominions, notably in Australia, where there is a branch of the Anc. Order of Druids (*q.v.*). Fraternal Societies, as they are called, are also common in the U.S.A., but except in Germany and France the system does not prevail to a great extent abroad. See also *FORTRESS*, *ANCIENT ORDER OF ODDFELLOWS*; *HIBCHARTERS*. See W. T. Pratt, *Friendly Societies*, 1931, and F. B. Fuller, *The Law Relating to Friendly Societies*, 1926.

Friends of the National Libraries, see LIBRARIES.

Friends, Society of (or *Quakers*), owes its rise to George Fox (1624-91), a native of Leicestershire. Although he had but little education, he was possessed of keen intelligence and spiritual power, and of a personality which won the affection of men and women of widely different sorts. In the demoralisation of Eng. life caused by the Civil war he found little help in his search for 'a principle that would overcome temptation,' and though he had a profound knowledge of the Bible, and set his life in the way of its teaching, he sought for spiritual assurance more fundamental than any external authority could give. He was driven to take his stand on his own conviction of the voice of God speaking within, shining in its own light or carrying its own evidence, i.e. not infallibly guaranteed by something more certain than itself. Thus he valued the Scriptures because in the light of God he recognised for himself that they were good. The religious thought of the day, taking its ultimate stand on the Scriptures, saw in this an under-valuing of them. This 'inner light,' or 'that of God in every man' was by the Quaker regarded as the light of Christ, who had always been active in the hearts of men, and whose outward appearance was a more eminent manifestation of himself than any other. This light was in the heathen, who were almost universally thought of as bound for an everlasting hell, but the Quaker asserted that for them there was salvation if they were obedient to such light as they had. He also repudiated the widely held

doctrine of predestination. In a time when extreme (often almost exclusive) stress was laid on correctness of doctrine, the Quaker, while not indifferent to this matter, put the emphasis on obedience to the light, insisting that it was *this*, not 'notions,' that showed the way to God. Throughout his life Fox called on Friends to bear themselves toward others in the way that was *most likely* to call forth the response of goodness to goodness, or, as he expressed it, 'answering that of God in every one,' even, in fact especially, in those who were doing evil. To a remarkable degree Friends lived out the truth that they had seen, but their exposition of it often lacked clearness and consistency, inasmuch as they were entangled in the spirit of their time more than they realised



GEORGE FOX

Nevertheless, although they might not have explicitly recognised the fact, it was from this central principle that their Quaker insistence on the unlawfulness of all war for the Christian is based not only on humanitarian grounds or even on passages of Scripture, but also on the conviction that more important than individual or national safety is the bringing of the evil mind to the light, whereas war deepens and multiplies the wrong. The Quaker pacifist position is no mean-spirited yielding to evil, but is a way of standing up to it which has in it the possibility of changing the evil mind, perhaps even by reason of the suffering endured by those who take this way. The whole matter turns on the ultimate standard of value which is set up. In early days when their meetings were broken up with violence and Friends themselves were taken to prison, they did not put up a fight, and women did not call on men to protect them, but men and women alike set themselves, sometimes successfully, by non-resisting endurance, to bring home to their persecutors a sense of their evil-doing.

The walking in the light led to a high standard of truthfulness, so that Friends in courts of law and elsewhere refused to confirm their words by oath, inasmuch as an oath lowers the value of ordinary speech. Not only did they quote Matt. v. 33-37 and James v. 12, but they also insisted that for a follower of Christ, the *Truth*, it was a lowering to attempt to confirm his word by something supposed to be more binding. 'People swear to the end they may speak truth; Christ would have them speak truth to the end they might not swear' (Penn). They were confirmed in their stand by seeing all about them the small regard for oaths paid by many who had solemnly taken them. This same principle led Quaker shopkeepers to break away from the custom of bargaining by asking for their goods a higher price than they intended to take. This they held to be insincere, but though their practice led to temporary loss of custom, the convenience of the fixed price was so obvious that it became the usual way of trading.

In their worship Friends give free play to the leading of the Spirit, and without arrangement of a service they wait before God in silence, not meeting merely as separate individuals but trusting that the fellowship of living silence shared together will naturally and frequently excite the worshippers both men and women to pray to and praise God and stir up one another by mutual exhortation and instructions (Barclay). The times of silence are times of worship equally with speech.

The kind of meeting just described is that which is held on Sunday morning; in many places the evening is mainly occupied with an address dealing with some aspect of Quaker thought or activity. The Quaker way of worship had been practised by the 'Seekers,' people whose needs were not met by any religious body and who were gathering by themselves in the way described. It was these in particular who were reached by the Quaker message, and whole companies of them came to Friends. Many of them had discarded the outward rites of Baptism and Holy Communion, and to this day Friends, not believing these to have been commanded as permanent ordinances for the Church, do not practise them. Nevertheless they lay great insistence on the reality which these rites are intended to convey or symbolise. A heightened conception of the light of Christ in every man has always rendered Friends keenly sensitive to outward conditions which put special difficulty in the way of obedience to it. From their beginning they have taken thought for the poor, having, even early on, some insight into the economic causes of poverty. Over a long period they have followed in the track of wars, organising (from their own people and from outside) measures of relief for civilian sufferers. This was done on a large scale after the Franco-Prussian war of 1870-71, and on a much larger scale during and after the First and Second World Wars. In 1947 the Nobel peace prize was awarded

jointly to the Amer. Friends' Service Committee and the Friends' Service Council, in recognition of the society's work for international reconciliation.

Early in the eighteenth century Friends officially condemned trading in slaves, and eventually they joined with Wesley, Wilberforce, and others in the movement for its abolition, which came about in 1807. In 1833 they won their campaign against slavery in the Brit. dominions. In the eighteenth century, Woolman, Benezet, and others induced Friends in America to give up slave-holding.

Fox's first recorded success in gaining converts was at Manchester in 1647, but the beginning of a Quaker Church was in 1652, when some hundreds of 'Seekers' were 'convinced' by him at Preston Patrick, near Kendal. After two years' activity in the N. of England, an organised campaign in 1651 carried the message all over England and Wales. About this time Friends' meetings began to be held in Scotland and Ireland. The glowing ardour, sometimes injudiciously manifested, of the preachers, and certain mannerisms, drew on them the attacks of the mob, sometimes led by ministers of religion, to whom the Quaker testimony against a paid ministry and the payment of tithes was naturally unpleasing. In 1650 Fox, when imprisoned at Derby on a charge of blasphemy, called upon Justice Bennett to tremble at the word of the Lord. The justice retorted by calling him 'Quaker,' a word that had already been used of a certain fanatic sect, and the name stuck to the newly formed body because of its appropriateness, inasmuch as in some of their meetings a wave of spiritual emotion would cause a trembling to go through the company. After the restoration of the monarchy in 1660 the Conventicle Acts of 1664 and 1670 made illegal religious meetings of more than four persons (in addition to members of the family in whose house they met) held otherwise than in accord with the way of the Anglican Church. In many places other nonconformists gave way before the storm, but according to the testimony of their enemies, Friends held out to the end, often meeting in the street in all weathers when their meeting-house was closed against them, many hundreds of men and women being taken to prison. The refusal, for reasons above given, to take the oath of allegiance brought down on many Friends long terms of imprisonment, their bare promise and their statement that it was against their principles to be concerned in plots not being accepted. About 450 Friends d. in prison or directly in consequence of imprisonment. It was shortly before 1670 when, by reason of the death or imprisonment of leaders, the cause of Quakerism was at a low ebb, that Wm. Penn (q.v.) and Robert Barclay (q.v.) came to it, and by their worldly standing, their learning, and the depth of their spiritual life they powerfully reinforced it.

The Toleration Act of 1689 gave liberty for nonconformist worship. For the next 150 years Friends settled down into

quietism, their 'testimonies' tending to become matters of ritual and tradition rather than of living conviction. They were marked off from the world by peculiarities of dress and speech, and they studiously secluded themselves from it except so far as they were mixed with it in business and as they answered the calls of philanthropy. Deservingly they gained a reputation for rigid honesty and for right living in general, but also for being almost a monastic sect not desirous of increase. In 1796 they opened the 'Retreat' at York, the first asylum in England, almost the first in the world, where the insane were treated with humanity and efforts made to cure them. Elizabeth Fry's work for prison reform, begun in the early nineteenth century, is well known. The fact that many Quaker conscientious objectors themselves suffered imprisonment in the First and Second World Wars has helped to keep alive the concern of Friends for penal reform, and they also work for the abolition of capital punishment.

The seclusion came to an end soon after the middle of that century, and from that time Friends have mixed in the world undistinguished in appearance from others. One result of this emergence was an interest in foreign missions and now (1919) Friends are working in India, China, Madrascar, Syria, and Pemba, and also maintain international centres in Geneva, Paris, London, etc., to promote international understanding. In their own country they have had a keen sense of civic responsibility, and very many of them, in proportion to their numbers, have taken part in the public life of their communities. John Bright and other Friends who entered politics in the nineteenth century were criticised for so doing by some of their fellow members, but that attitude has passed. There are at present (1919) ten members of Parliament who are Quakers. Excluding themselves for a large part of their hist. from art and music and various forms of literature, they have found recreation in natural hist. and science, and in those branches of knowledge and in medicine the society has contributed to England a large number of eminent men. In philanthropic and commercial enterprise many of its members have been pioneers. Toward the end of the nineteenth century Friends were confronted with the new learning and thought of the time, and though for half a century they had leaned toward the 'evangelical' type of theology, the essential Quaker principle made it less difficult for them than for many others to receive new biblical and scientific knowledge. It became evident that in the absence of the regular minister they had suffered from lack of teaching, and in 1903 there was opened at Nelly Oak, Birmingham, an institution, Wcoudbrook, where, for longer or shorter periods, men and women, both Friends and others, may receive instruction in biblical, international, economic, and kindred subjects.

From its beginning the Quaker Church has needed an organisation; the present system is substantially the creation of

Fox shortly before 1670. In the Preparative Meeting a single congregation deals with its own affairs; sov. Preparative Meetings form a Monthly Meeting, the executive body; among other business it admits members and records withdrawal; it appoints elders and overseers, whose functions will be stated later, it carries through arrangements for marriage in the Quaker way, whether the parties are Friends or not; sov. Monthly Meetings form a Quarterly Meeting, concerned with the affairs of Friends in one or more coys., and a union of Quarterly Meetings forms a Yearly Meeting, the legislative body for its area. London Yearly Meeting comprises Great Britain; Dublin Yearly Meeting, Ireland; and there are others in the U.S.A., India, China, and on the Continent of Europe and elsewhere. Any Friend may attend any of these meetings and, in any of which he or she is a member, may take part.

Each meeting is presided over by a man or woman (aided by an assistant) who acts as secretary, and is called the clerk. Decisions are not arrived at by vote, but after discussion (free from noise of applause or dissent) the clerk records what he considers to be the judgment of the meeting. If on important matters there is considerable difference of opinion a time of quiet waiting or an adjournment almost always leads up to a conclusion which can be unitd in by most, if not by all.

The Meeting for Sufferings, estab. in 1675 to supply the needs of sufferers from persecution, is a representative assembly, meeting monthly in London. It is the executive body of the Yearly Meeting, and it also takes cognisance of the concerns of Friends for service in any part of the world; it is sensitive to the cry of suffering wherever heard, and it watches legislative and other movements which have special bearing on national and international righteousness.

Elders are appointed to care for the ministry, giving advice in the way of restraint or encouragement as is required. Overseers are appointed to have a special care for the congregation, to know who are in any way in need, who are making inquiries concerning Friends, who are needing counsel, to see to the education of children, etc.

The S. of F. consists of 20,847 members in Great Britain, and has 425 places of worship. There are, in addition, several thousand regular 'attenders' of meeting not in membership. The headquarters of London Yearly Meeting is Friends House, Euston Road, London, N.W.1., opposite Euston station. The Irish headquarters is in Eustace Street, Dublin. The total number of Quakers in the world is about 164,000.

The Society of Friends in America.—In 1656 Quakerism was taken to America by two women, and others followed, but the colonists, fearing them to be in league with witchcraft and the devil, subjected them to terrible persecution. Three men and a woman were hanged. Before long, however, Quakerism became a dominant

influence in Pennsylvania and other colonies both in religious and political life. A period of quietism set in, as in England, and shortly before 1830 Elias Hicks of Long Is., so far pressed the doctrine of the inner light as to result in a self-sufficient individualism independent of the scriptures or other outward aid. He was opposed with unsympathetic rigidity and a secession ('Hicksite') resulted. Those who remained again divided, the extreme conservatives separating from the majority, who were moving toward an undenominational evangelical type of theology. Philadelphia stood apart, its position now being that of Eng. and Irish Friends. Those from whom the conservatives parted are (with the exception of certain Fundamentalist Yearly Meetings) organised into the 'Five Years Meeting,' headquarters Richmond, Indiana. With few exceptions (Baltimore and others) they have given up the Quaker way of worship and meet under pastors. They retain the Quaker organisation and (for the most part) the position concerning war and the outward sacraments. The different sections are moving toward a sympathetic understanding of one another.

See George Fox, *Journal*, 1694 (ed. by N. Penney and T. E. Harvey, 1911; ed. abridged) by N. Penney, 1924); A. C. Bickley, *George Fox and the Early Quakers*, 1884; R. M. Jones, *The Quakers in the American Colonies*, 1911, *The Later Period of Quakerism*, 1921, and *The Faith and Practice of the Quakers*, 1928; W. C. Braithwaite, *The Beginnings of Quakerism*, 1912, and *The Second Period of Quakerism*, 1919; E. Grubb, *What is Quakerism?*, 1919; J. W. Graham, *The Faith of a Quaker*, 1920; and E. E. Taylor, *The Valiant Sixty*, 1947.

Friern Barnet, see under BARNETT.

Fries, Elias Magnus (1791–1878), Swedish botanist, b. in Småland. He was prof. of botany at the univ. of Lund (1824) and prof. of practical economy at Upsala (1834). In 1851 he was called to the chair of botany at Upsala, and was also appointed director of the botanical museum and garden there. He wrote *Novitiae florae Suecicæ; Observations mycologicae; Flora Hollandica; Systema orbis vegetabilium; Elenchus funorum Lichenographia Europæ; Summa vegetabilium Scandinavæ; and Monographia hymenomycetum Suecicæ*.

Fries, Jakob Friedrich (1773–1843), Ger. philosopher, b. at Barth, Saxony. He was prof. of philosophy and elementary mathematics at Heidelberg in 1806, and in 1816 was invited to fill the chair of theoretical philosophy at Jena, but was deprived of his professorship for participation in the democratic disturbances of 1819. He was, however, recalled in 1824 as prof. of mathematics and physics, and while at Jena wrote *Handbuch der praktischen Philosophie* (1817–32); *Handbuch der psychischen Anthropologie* (1820–21); *Die mathematische Naturphilosophie* (1822); *System der Metaphysik* (1824); and *Die Geschichte der Philosophie* (1837–40). Besides these he wrote the important treatise, *Die neue oder anthropologische*

Kritik der Vernunft (1807), in which he attempted to give a new foundation of psychological analysis to the critical theory of Kant. He is a link between Kant's system and the so-called historical school. See T. Eisenhans, *Fries und Kant*, 1906, and E. Gaede, *Die Religionsphilosophie von J. F. Fries und A. Gorland*, 1935.

Friese-Greene, William Edward (1855–1921), Eng. inventor, b. at Bristol; educated at St. Elizabeth's Hospital School, Bristol. His patronymic was Green; he took the name of Friese-Greene after his marriage in 1874 with Helena Friese. At the age of fifteen he was apprenticed to a Bristol photographer, but after his marriage he set up a studio of his own in Bath. In 1880 he became associated with J. A. R. Rudge, the inventor of a form of magic lantern called the bio-phantoscope. With Rudge he built a primitive projector for showing twelve photographs on glass plates in quick succession. With this F.-G. gave the first demonstration of cinematography in England. This was at a meeting of the Photographic Society in 1885. He realised the need for using some other substance than glass, and after a number of experiments with sensitised paper he was one of the first to appreciate the advantages of celluloid film. In 1899 he was granted a patent for a camera made "to produce a series of instantaneous photographs of moving bodies which may afterwards be combined to produce animated pictures." This camera had many resemblances to the modern ciné-camera, but was not put into practical use. F.-G. was compelled to sell the patent, and with the subsequent growth of the cinema industry his pioneer efforts were largely forgotten. He was also a pioneer with his experiments in colour photography, and was a profound believer in the possibilities of stereoscopic photography. A long list of patents stands to the credit of his inventive genius. He gained little critical recognition, however, and his costly experiments were paid for out of the proceeds of his work in studio photography in London, and later in Brighton. He was in very straitened circumstances at the time of his death, which occurred suddenly from heart failure during a meeting of film exhibitors. See R. Allister, *Friese-Greene: Close-up of an Inventor*, 1948.

Friesland, or Vriesland, prov. of Holland, on the N.E. side of the IJsselmeer (Zuider Zee). The surface is flat, and the coasts are protected by dikes, much of the prov. being below sea level. The chief industries are cattle-rearing and the making of cheese and butter, but on the clay lands agriculture is also extensively practised. Woollens, fine linen fabrics, and sail-cloth are manufactured, and peat is dug in the higher fen dist. The prins. tns. are Leeuwarden, Sneek, Bolsward, Franeker, Dokkum, and Heerenveen. Pop. 456,800.

Friesland, East, see AURICH.

Frieze, in classical architecture that member of the entablature immediately above the architrave and below the cornice. It is decorated in various ways according

to the style of the architecture. Its most notable feature in the Doric style is the series of *triglyphs*, features which project slightly from the regular face and which receive their name from the channels which run down them. The triglyphs are divided one from the other by spaces as wide as the height of the F., which are named *metopes*. These are often elaborately adorned with sculpture. The Ionic F. has no triglyphs and is but rarely adorned with sculpture, and this is true also of the later developed Corinthian order. In domestic architecture the name F. is given to the band of decoration which runs round the interior walls of a building immediately below the cornice.

Frigate, originally an oared sailing ship of the Mediterranean. Many such ships were built for the Brit. Navy in the seventeenth century; but it was only during the Seven Years war that the first ship of the type technically known as a F. was built—a fast, full-rigged ship with upper deck, spar deck, and lower deck, carrying guns which by 1808 had increased in number to fifty.

Frigate Bird, or Man-of-War Bird (*q.v.*), marine bird belonging to the sub-order Stegarinae of the order Ciconiiformes, and a member of the tropics. Its colour is black, strongly tinged with brown, while the pouch is scarlet. It is a large bird, having a long tail and wings, and a long hooked beak. It is essentially a sea-bird, and only comes to land during the breeding season. Its chief food is fish, and it has the habit of seizing the prey which it has forced another bird to disgorge. The two species of this family Frigatidae are *Fregata aquila* and *F. minor*.

Frigga, see FREYJA.

Friggian Lizard, see CHAMYDOSAURUS KINGI.

Frimley, tn. in Surrey, England, 30 m. S.W. of London. It now forms an urb. dist. with Camberley. It is mainly residential. Pop. (with Camberley), 15,300.

Fringillidae, see FINCH.

Frinton-on-Sea, seaside resort in Essex, England, 7 m. N.E. of Clacton. A favourite centre for tennis tournaments. Pop. (with Walton-on-the-Naze), 9900.

Friol, com. in the prov. of Lugo, Spain. Pop. about 9000.

Frisches Haff, lagoon of Poland (formerly E. Prussia). It is almost entirely separated from the Baltic by the Frische Nehrung, a strip of land about 40 m. long, its only means of connection with that sea being at Pillau, at its N.E. end. The Haff is nearly 60 m. long, and varies in width from 1 to 15 m. In 1915, in the Russian invasion of E. Prussia, there was protracted fighting in the vicinity of the F. H., Königsberg being the objective. On Jan. 26 Soviet troops reached the gulf of Dünzig, and thereby cut off the E. Prussian garrison from central Germany. Elbing was taken on Feb. 10. Braunberg fell after a severe struggle, but Pillau long held out, and Königsberg only surrendered on April 9.

Frisi, Paolo (1728-84), It. mathematician, was a native of Milan. At the age of fifteen he entered the Barnabite

order, and in 1756 was appointed prof. of mathematics at Pisa. In the year 1764 he received a similar appointment in Milan, and just after this time visited sev. of the countries of Europe. Among his works may be mentioned *Disquisitio mathematica* (1751); *De Causa electricitatis dissertation* (1757); and *Cosmographia physica et mathematica* (1774, 1775).

Frisian Islands, series of islands situated in the North Sea and extending along the coasts of Holland and Belgium. See B. Schulz, *Die deutsche Nordsee, ihre Küsten und Inseln*, 1928.

Friscians, seafaring people of Teutonic stock, who in the first century of the Christian era inhabited the coast lands between the mouths of the Scheldt and the Ems. They were tributary to Drusus, and were made sooth of the Rom. people, but in A.D. 26 broke out into revolt. They were, however, again subject to Corbulo in 47, but shortly afterwards all Rom. troops were withdrawn to the l. b. of the Rhine. In 58 they made an unsuccessful attempt to seize lands between the Rhine and the Yssel, and in 70 took part in the campaign of Claudius Civilis. After this they disappear from hist., for it is uncertain whether they took part in the conquest of Britain, but come again into prominence in the seventh century with the rise to power of the Franks. These people attempted to Christianise the F., but met with small success until Wilfred of York landed, and it is significant that both he and Willibrord, who came to Frisia in 692, found no difficulty in converting the inhab. The struggle between the Franks and the F. lasted for about 200 years, and although the F. made a stand for their freedom, they were compelled to cede the dist. from the Scheldt to the Zuider Zee to Pippin of Herstal after an unsuccessful battle at Dorstadt in 689, and in 734 to acknowledge the supremacy of the Franks in the N., being finally subdued in 793 in the days of Charles the Great. They were again in revolt under William of Holland, emperor 1248, and although W. Friesland was subdued, the inhab. to the E. of the Zuider Zee resisted all attempts to bring them to subjection, and the main body of the F. was still independent when the co-intship of Holland passed into the hands of Philip the Good of Burgundy. He laid claim to the whole country, but the people called on Frederick III. in 1457 to protect their rights, and they were acknowledged as dependents of the empire, but in 1498 Maximilian, Frederick's son, detached the prov. of Friesland from the empire and gave it as a fief to Albert of Saxony, and in 1523 it fell with the rest of the provs. of the Netherlands under the rule of the Emperor Charles. From 1579 to 1795 it was one of the constituent parts of the republic of the United Provs., preserved its own dialect, and had a separate stadholder, but in 1718 William IV. was made hereditary stadholder of all the provs., and his grandson, in 1815, took the title of King of the Netherlands.

Language.—W. Frisian is spoken by about 320,000 people in the Dutch prov.

of Friesland, and on the is. of Terschelling and Schiermonnikoog; E. Frisia in Hanover prov. and the outlying is. of Oldenburg is dying out; and N. Frisian, spoken by about 15,000 people on Föhr, Sylt, and the coast between Tondern and Husum. But the language is being supplanted more and more by Dutch, *Plattdeutsch* in Germany, and Dan. See J. Jung-Diesenbach, *Die Friesenbekhrung*, 1931.

Frith, or Fryth, John (1503-33), Eng. Protestant, b. at Westerham in Kent, and was educated at Eton and Cambridge. Being invited by Wolsey he went to Oxford, and on account of his zealous support of reformation principles he was imprisoned. He was, however, released, and he then retired to Marburg, where he collaborated with Tyndale in his literary work. On his return to England in 1532 he was condemned to death for heresy, and burnt at Smithfield. He wrote, among other works, *Disputation of Purgatorye* (1531).

Frith, William Powell (1811-1909), Eng. artist, was a native of Aldfield, Yorkshire. He became a Royal Academician in 1853. His first attempts were subject pictures such as 'Othello and Desdemona' and 'Coming of Age in the Olden Time.' After 1853, however, he began portraying scenes characteristic of Eng. crowds. The grouping in these pictures shows great dexterity, and the types of people that he depicted testify to his observation and sense of humour. Among the best of these works are 'Derby Day' (Tate Gallery), 'Life at the Seaside,' and 'The Railway Station.' His *Reminiscents* were pub. 1887-98.

Frith, see FIRTH.

Friðið's Saga, see TEGNTR, ESAIAS.

Friuli, dist. of Italy of about 3000 sq. m., comprising the prov. of Udine and the dists. of Gorz and Gradisca in Austria. In mediæval times F. was itself a duchy. Pop. 671,000.

Froben, or Frobenius, Johannes (c. 1460-1527), Ger. printer, b. at Hammelburg in Bavaria. He was educated at the univ. of Basle, and in 1491 founded a printing office in that city and issued about 300 works, among which may be mentioned his *Neues Testament* in Gk. (1510), which was used by Luther for his trans., and his eds. of St. Jerome, St. Cyprian, Tertullian, St. Ambrose, and Erasmus. Some of his texts are illustrated by Hans Holbein. It was largely owing to F. that Basle was the leading centre of the Ger. book trade in the sixteenth century.

Frobenius, Leo (1873-1938), Ger. ethnologist, b. in Berlin. Studied at Basle. Led ten scientific expeditions to Africa and Asia Minor between 1904 and 1932. During this period of active field work in difficult countries, he found time to write his monumental works, to contribute numerous monographs and memoirs to scientific journals, to deliver lectures, and to found his famous Institute of Culture Morphology at Frankfort-on-Main in 1925 with his valuable material. From this unique foundation, devoted exclusively

to Africa and Oceania, Graebner and Wilhelm Schmidt were to found new schools of comparative anthropology in Vienna and elsewhere. F.'s work is of great importance to Africanists, and the fact that W. African art and culture became at all known and admired in Europe and the world was due to the scientific enthusiasm of Prof. F. See P. Hambruch, *Das Wesen der Kulturreise*, 1924.

Frobisher, Sir Martin (c. 1535-94), Eng. navigator, b. in Yorkshire. He made his first voyage to Guinea in 1554, and in the following ten years went on yearly expeditions to the N. shores of Africa and the Levant. In 1576 he made his first voyage in search of a N.W. passage under the auspices of Ambrose Dudley, earl of Warwick, reaching Frobisher Bay, and in the following year, as admiral of the company of Cathay, sailed to the same region in search of gold, and explored S. of Meta Incognita and Jackman's Sound, bringing home 200 tons of gold from Kodjum-arn. In 1578 he made his third voyage, and discovered a new strait and the upper part of Frobisher Bay, and in 1586 was vice-admiral in Drake's expedition to the W. Indies. He was in command of the *Triumph* fighting against the Sp. Armada, and led one of the four newly formed squadrons, and the same year was knighted and put in command of a squadron of six ships to sweep the Narrow Seas. In 1590 he was vice-admiral to Sir John Hawkins, and in 1592 captured a large Biscayan ship with a valuable cargo of iron, etc. In 1594 he took part in the expedition for the relief of Brest and Crozon, and received a wound from which he afterwards d. at Plymouth. See F. Jones, *Lif' of Frobisher*, 1878, and P. F. Alexander (ed.), *The North-West and North-East Passages, 1576-1611*, 1915.

Froebel, Friedrich Wilhelm August (1782-1852), Ger. educational reformer, b. at Oberweissbach. The neglect he experienced in his youth led to his anxiety to promote the happiness of children. His mother d. in his infancy, and F. was apprenticed to a forester. In this position in the Thuringian forest, he applied himself to the study of nature. No training could have been better suited to strengthen his inborn tendency to mysticism. Unity of nature was the conception in him which dominated all others. With difficulty he got to the univ. of Jena, but his allowance was too small to support him, and his univ. career ended in an imprisonment of nine weeks for a debt of thirty shillings. In 1802, when he was twenty, his father d., and during the next few years he took up land-surveying, acted as accountant and private secretary, but all the time was conscious that he was meant to benefit humanity in some way, how he did not know. Whilst he was studying architecture in Frankfort-on-Main the director of a model school, who had caught some of Pestalozzi's enthusiasm, persuaded him to take a post in his school. Later he retired from this post and educated three lads in one family. He obtained the

consent of the parents to his taking the boys to Yverdon, near Neuchâtel, and there formed with them a part of the celebrated institution of Pestalozzi. For two years he was qualifying to carry on the work begun by Pestalozzi. Taking the results at which he had arrived through the necessities of his position, F. developed the ideas involved in them, not by further experience but by deduction from the nature of man, and thus he attained to the conception of true human development and to the requirements of true education. F. now determined to continue the univ. course interrupted eleven years before, but again he was stopped, this time by the king of Prussia's celebrated call to 'my people,' so he enlisted in Lützow's corps and went through the 1813 campaign. Through his patriotism he met Langenthal and Middendorff. These two young men became attached to him on the field, and were ever after his faithful followers. Later he opened a school, starting with his own orphaned nieces and nephews as pupils. An educational institution was started by F. in Switzerland, but it proved a failure. The Swiss Gov., wishing to turn his presence to advantage, sent young teachers to him for instruc.'on. It felt that till the school ago was reached, children were neglected, and he schemed for small children a graduated course of exercises, modelled on the games in which he found them most interested. At Keilhau he opened the first kindergarten, in the near-by vil. of Blauenberg. This was in 1837. Self-activity was the keynote. The children were taught to do things; it was play, but as they played they learnt. F. wrote his *magnum opus*, *Die Menschen-erziehung* (The Education of Man), in 1826. He believed that 'all education not founded on religion is unproductive.' Pestalozzi taught the development of faculties through exercise, but F. postulated the function of education as the superintendence of inborn faculties by self- or voluntary activity. He held, with Comenius, that the knowledge of nature is the indispensable means of education; with Rousseau that each age has an organic and psychic completeness, but he added importance to the earlier stages. It was natural for him to devote himself, as did Pestalozzi, to the instruction of mothers. While Pestalozzi maintained that the child belonged to the family and Fichte declared categorically that he belonged to society, F. claimed that he belonged to both; he therefore instituted the kindergarten, in which educational play has a great part. See *Autobiography* (trans. 1903), and Emily Shirreff, *The Kindergarten*, 1876.

Frogbit, water-plant of the genus *Hydrocharis* (*H. morsus-ranae*), of the order Hydrocharitaceae. It is monocotyledonous and the leaves are ribbon-like. It is common in still ponds.

Frog-hopper, **Frog-spit**, see CUCKOO-SPIT.

Frogmore, see under WINDSOR CASTLE.

Frogs, name applied to the family Ranidae of the Ecaudata order, but in

common speech the term is loosely used to include other families of the Ecaudata order. The family Ranidae includes some 200 species. The differential characteristics of the family are the presence of cylindrical, transverse processes on the sacral vertebrae, of teeth in the upper jaw, and the vomer, the fixation of the tongue in front instead of behind, more or less marked webbing between the toes, and a horizontal pupil in the eye. The best known varieties of F. are the Brit. F. or *Rana temporaria*, the edible F. or *R. esculenta*, and the Amer. bull-F. or *R. ratesiana*. There are also many very remarkable members of the family. For instance in W. Africa there is found a hairy frog, the *Trichobatrachus robustus*, on whose sides and hind limbs long villous

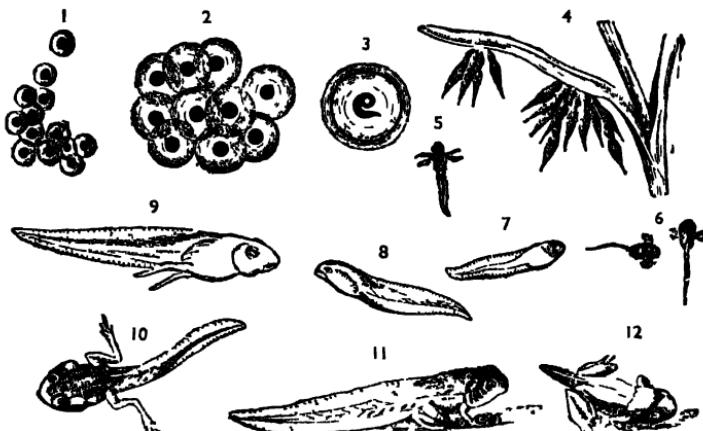


FLYING FROG

outgrowths are seen. Most of the tree-F. are now known to be more nearly allied to toads than to F., but the *Rhacophorus* of E. Asia, called by Wallace the flying frog, is a true member of the family Ranidae. It has markedly developed webs between the toes which it uses as parachutes in jumping from branch to branch. Other tree-F. make nests in the branches of trees which overhang water. The Brit. F. hibernate in holes in the ground. In the early spring they come above ground and mate. At this season a horny cushion appears on the first finger of the male frog. The eggs are laid in water, and are fertilised as they are laid. Nearly all F. desert their eggs, though there is one species in which the male places the eggs into hollows on the female's back, where they stay until they hatch out. The tadpoles hatch out from the eggs in about a fortnight. At first they are fish-like animals with external gills, and a long swimming tail, but no limbs. The first change to take place is the disappearance of the external gills, and the development of internal gills, which are still later supplanted by lungs. The hind legs appear before the front legs,

and the last change to occur is the diminution and final disappearance of the tail. The tadpole stage lasts about three or four months. At the end of this time the animal leaves the water and lives in grass. Some species such as the edible frog are always aquatic. The grass frog lives mainly on insects, small worms, etc., which it catches very cleverly with its tongue. By autumn the frog grows big and sluggish. It stores fat in a special gland in the abdomen, and this fat is what it lives on during its winter sleep.

Froissart, Jean (1338-1410), Fr. historian, chronicler, and raconteur. His own verses and chronicles tell the story of his life. He was curé of the vil. of Lestimos, but there are no memories of him there; he made no mark on the inhab. No one can point to any house in Valencionnes, and say that he once lived in it. Even the time and place of his death are not certain, nor do we know his burial place. The church of St. Monegunda of Chumay claims to hold his bones. His forefathers were aldermen of Beaumont, near the R. Sambre, to the



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DIAGRAM OF LIFE HISTORY OF A FROG, AFTER BRÜHM

1-3, developing ova, 4, newly hatched forms clinging to water weed, 5, 6, stages with external gills, 7-10, tadpoles during emer.ence of limbs, 11, tadpole with both pairs of limbs apparent, 12, metamorphosis to frog

Frohschammer, Jakob (1821-93), Ger. theologian and philosopher. In 1847 he became a priest. His logical intellect would not allow him to yield the Church unquestioning obedience. In 1850 he pub. his *Beiträge zur Kirchengeschichte*, which was placed on the Index Expurgatorius. In 1855 he became prof. of philosophy. He went on publishing controversial works which gave offence to his eccles. superiors. He was denounced by the pope, and students were forbidden to attend his lectures. He was, however, accorded a public ovation, and the king gave him his support. In 1862 he founded the *Athenaeum* as the organ of Liberal Catholicism. In 1871 he was excommunicated. His system is based on the unifying principle of immanization, which he extends to the objective creative force of nature, as well as to the subjective mental phenomena to which the term is usually confined. His *Autobiographie* was pub. in 1888. See A. Hinrichsen, *Deutsche Denker*, 1888, and G. Wüchner, *Frohschamers Stellung zum Theismus*, 1913.

W. of the forest of Ardennes. His father was a painter of armorial bearings. There is nothing to show that F. was, as a boy, unlike other boys. He loved games of dexterity and skill rather than sedentary amusements such as chess and draughts. All the splendour of medieval life was to be seen in his native city. Knights and soldiers, priests and artisans, crowded the streets. The churches were rich with stained glass, and the libraries were full of wonderfully illuminated MSS. There were festivals, masques, mummeries, and moralities. It was a time of plenty in which he lived. Quite early he loved a demoiselle. He remarked the beauty of her blue eyes, and became provided with that essential for knight, soldier, or poet, a mistress, one for whom he could write versos, but the lady was cold and the poet was sad. Not till the day he was leaving his native city did she grant him an interview. The conclusion of his only *l'oeuvre* is simply told in his *Trette de l'espinielle amoureuse*. The progress of the amour was rudely

interrupted by calumny, and this led to a complete rupture. Queen Phillipa made him her secretary, and later King John of France made him his. He is said to have died in great poverty. His poetry was inelegant and monotonous, but his *Chronicle* is universally admitted to be a great work. See J. Bouchier, Baron Bierners (ed.), *Chronicles*, 1927-28, and F. S. Shears, *Froissart, Chronicler and Poet*, 1930.

Frome, m.rkt. tū. in Somersetshire, England, 107 m. from London and 24½ m. from Bristol. It contains a fourteenth-century church, a market-hall, museum, school of art, and a free grammar school, founded under Edward VI. There are breweries, foundries, wire-card manufacturers and edge-tool works. The woollen trade, formerly the prin. industry, is declining. Pop. 11,000.

Fromental, Jacques François, see HALÉVY, FRONTELIAL.

Fromentin, Eugène (1820-76), Fr. painter and writer, b. at La Rucholle, son of a well-to-do physician. First put to study law in Paris, and there he discovered in himself a dual gift for writing and for painting, and these were the springs of his earliest work (1841), a long poem *Sur la peinture moderne*. Studied under Louis Cabat, the landscape painter. His first great success was produced at the Salon in 1847 by the 'Gorges de la Chiffa.' He was much influenced in style by Eugène Delacroix. His later work shows signs of an exhausted vein caused by physical enfeeblement. His writing showed another side of his genius. He wrote less than he painted, but he expressed himself more really in literature than in painting. F. did not find much recognition as a painter during his lifetime. Even after he had established himself as the 'African' master (he travelled extensively in N. Africa during the 1840's) and had received the First medal at the Salon, and also the Legion of Honour (1859), he was not given any official commissions and began to give up painting. His success, such as it was, was made by his two famous illustrated travel books—*Un Elé dans le Sahara* (1857) and *Une Année dans le Sahel* (1859), which won the praise and friendship of Sainte-Beuve and George Sand. His fame was enhanced later by his books *Maitres d'autrefois* (1876), an exposition of Dutch and Flemish painting, trans. as *Masters of Past Time* (1913); and *Dominique* (1863), and it is in them that his name has survived. *Dominique* indeed has an enduring place in the classical works of Fr. literature. He also wrote *Visites artistiques* (1852) and *Simple Pèlerinage* (1856). His most important pictures are 'La Place de la brèche à Constantine' (1849); 'Enterrement Maure' (1853); 'Bateleur nègre' (1859); 'Audience chez un chalife' (1859); and 'Berger kabyle' (1861). In 1876 he was an unsuccessful candidate for the Académie. See lives by L. Gouze, 1881; P. Dorbec, 1926; G. Assouant, 1931, and M. Revon, 1937.

Fronde (1648-52), name given to a civil war in France, and also to its sequel,

a war with Spain (1653-59). The word means 'a sling,' and it was used to describe this contest, because the windows of Cardinal Mazarin's followers were pelted with stones by the mob in Paris. Originally the object was the redress of grievances, but there was a factional contest between nobles and Mazarin, the former attempting to reverse the results of Richelieu's work and to overthrow Mazarin, his successor. In May 1648 a tax levied on judicial officers of the Parlement de Paris was met by that body not merely with a refusal to pay but also with a condemnation of earlier financial edicts, and even with a demand for the acceptance of a scheme of constitutional reforms, framed by a committee of the Parlement. This charter was influenced by contemporary events in England, but there is no real likeness between the two revolutions, the Fr. Parlement being no more representative of the people than the Inns of Court were in England.

Frontenac, Louis de Buade, Comte de (1628-98), Fr. colonial officer, descendant of an anc. Fr. family. Entered the army in 1635 and soon rose to be brigadier. After a brilliant army career he was appointed governor of the Fr. possessions in N. America in 1672. His restless activity was a source of strength and vitality to the colony, but it led him into difficulties with the other colonial authorities and with the home gov. His first quarrel was with Perrot, governor of Montreal, whom he caused to be put into prison. Then came a prolonged and acrimonious dispute with the intendant Duchesneau, each accusing the other of making illegal gains out of the fur trade. The king, becoming impatient at such continual discord, at length recalled both. During this, his first term of office, he built Fort F. (now Kingston, Ontario) to control the Iroquois, whom he treated with mingled kindness and firmness and among whom he was known as the great 'Onoutio' (meaning the 'big mountain,' from Montagnay, the second Fr. governor-general of Canada). After Denonville, the eleventh governor-general, had been recalled in 1689, the Fr. king again turned to F., who, in spite of his seventy years, again assumed the burden of office. He returned to find that Denonville had ordered Fort F. to be destroyed and that the Iroquois tribes were imperilling the countryside. F. then planned an attack upon the New Englanders. The Eng. colonists, knowing that the Iroquois, their allies, were attacking Canada from the W., replied by attacking the Fr. settlements of New France by sea. But the preparations which the New Englanders had made for an attack on Montreal, with the help of the Iroquois, proved as great a failure as their attack on Quebec. In his second term F. so broke the power of the Iroquois that they were never again a terror to the colony. F. was the strongest ruler Canada had seen since the death of Champlain. See life by F. Parkmann, 1918.

Frontier College, Canada, organisation by which young men of good education

spend some part of the summer in the N. lands, doing manual work, and giving educational instruction. The scheme was begun in 1890, for E. Canada, and was extended to the W. provs. nine years later. The instructors are univ. graduates, students, or teachers, and their pupils are lumberjacks, miners, and navvies, with occasional settlers. During the past fifty years about 500,000 have received elementary education and taken part in discussions on public affairs, Canadian hist., etc.; in addition, many foreign-born workers have been taught the Eng. language.

Frontinus, Sextus Julius (c. A.D. 40-103), Rom. writer and soldier, was prator in A.D. 70. He was governor of Britain in 75, and while holding that office distinguished himself by the conquest of the Silures. In 97 he was nominated *curator aquarum*, and d. about 106. He wrote *Strategematicon libri iv.*, a book on the art of war, and *De aqueductibus urbis Romae libri ii.*, which contains a hist. and description of the water-supply of Rome, and other matters of importance in the hist. of architecture.

Fronto, Marcus Cornelius (c. A.D. 100-170), Rom. historian, was b. in Numidia. He came to Rome in the reign of Hadrian, became very famous as an orator, and was made tutor to Marcus Aurelius and Lucius Verus. Few only of his works are extant, and these fall far short of the writer's great reputation. A number of his letters, addressed chiefly to Antoninus Pius, Marcus Aurelius, and Lucius Verus, were pub. at Rome in 1823.

Frosinone, tn. of Italy in the prov. of Rome, 32 m. from Gaeta. Pop. 9600.

Frost, Robert Lee (b. 1875), Amer. poet, b. at San Francisco. His parents, who were of New England stock, returned to their home and F. was educated at Amherst College and Harvard. He worked his own little farm at Derby, New Hampshire, 1900-5, and taught Eng. at the local Academy from 1905 to 1911. He then taught psychology from 1911 to 1912 at the New Hampshire state normal school, and from 1916 was prof. of Eng. at Amherst College. F. has identified himself completely with New England and its way of speech. He is not only a devotee of New England colloquialism and New England colour, but he is also a stern realist in his poems. He himself claims kinship with Emerson. But Emerson in his poems often celebrated the flora of New England. F. sings of the human beings—their isolation on their small farms, the weight of the long winters, the tasks to be done, the pessimism and sadness that often come. His work has been crowned by winning the Pulitzer prizes for Amer. poetry. His best vols. are *North of Boston* (1911); *Mountain Interval* (1916), and *New Hampshire* (1923). His *Collected Poems* were pub. in 1930 and 1939; *A Further Range* (1936); *Selected Poems* (1937); *A Witness Tree* (1943); and *A Masque of Reason* (1949). See studies by G. H. Munson, 1927, and S. Cox, 1929.

Frost, that condition of climate when the temp. of the air is below the freezing-

point of water; the term is also applied to manifestations in the form of small crystals of ice. Under ordinary conditions of pressure pure water solidifies at 0° C. or 32° F. Water containing substances in solution freezes at temps. somewhat below this point. Water contracts as it cools down to 4° C., but below that point it expands for a decrease in temp., and as it solidifies in a crystalline form it takes up more space as a solid than as a liquid. Therefore water-pipes are likely to burst during a F., though the subsequent leakage is not discovered until the thaw, or period when the temp. has again risen above 0° C. The expansion of freezing water is also responsible for breaking off large pieces of rock when water has collected in cracks, and for the general disintegrating effects of F. upon soil and even vegetable structures. The general condition determining F. is diminution of temp. below 32° F., but in the Brit. Isles this does not obtain as an average condition, even through Jan., the coldest month of the year. There are therefore usually special circumstances connected with F.s. After the sun has set the earth gradually loses heat by radiation from its surface. Radiation is hampered by an abundance of water-vapour in the atmosphere, therefore F.s. occur on clear nights when there is neither cloud nor wind. These conditions are characteristic of anticyclonic periods, that is, when there is a high barometric pressure and the air gently flows outwards from the anticyclonic area. Anticyclones are associated with warm sunny days even in winter, and with clear frosty nights even in summer. As the likelihood of F. depends upon the freedom of the atmosphere from water-vapour, some indication of the probable night temp. may be gained from an examination of a wet- and dry-bulb thermometer; a good estimate is obtained by multiplying the difference between the wet- and dry-bulb readings by $\frac{1}{4}$, and subtracting the result from the actual air temp. (dry bulb). Sometimes the frequency of F.s. is affected by the nature of the land with regard to slope. On a calm night the heavier cold air tends to flow down the sides of hills to the valleys below, therefore plantations on the slopes of hills are not so liable to F. as those in the valleys. The effects of F. on agric. enterprise may be advantageous, or the reverse, according to the seasonability of the low temp. Thus a F. in winter helps to break up the ground and checks the growth of plants at a time when too early development might be dangerous. On the other hand, spring F.s. often do great damage by destroying blossoms and fruit buds. The destructive action of F. on vegetation is due to the formation of ice on the outside of the cells, from which the water has been squeezed by the contraction due to low temp.: if the ice thaws rapidly the water cannot be reabsorbed by the cells in time, and either runs off and causes the plant to dry up, or collects in intercellular spaces and causes decay. As F.s. do not often occur in our climate when the air is humid, attempts are some-

times made to prevent a threatened F. by flooding the soil. This causes a bank of mist to rise up and serve as a blanket for the prevention of over-much radiation. A bank of smoke has the same effect; therefore it is the custom to light fires in such positions that the smoke will drift over threatened orchards, etc. Small areas may be sufficiently protected from a light F. by coverings of straw, paper, etc. See R. Bush, *Frost and the Fruit Grower*, 1943.

Frostbite, consequence of the action of great cold on parts of the body for some time. Limited areas of the body may be frozen briefly, as in surgical operations, with impunity. But when larger portions are frozen for considerable periods, especially when the circulation returns too soon, more outlying parts—say, the fingers in the case of a frozen hand—may perhaps die, and be severed by gangrene from the parts which are alive. It is stated to be specially apt to occur in persons given to the use of alcoholic drinks, whose blood-vessels are prone to lose their vital condition and cause sluggish circulation. If circulation does not return the part affected may simply shrivel up and turn black and gangrenous. But if the initial, less severe circulation returns as the part thaws, and the vessels become swollen, red, and painful, sometimes with inflammation and subsequent gangrene. The condition is preventible by adequate covering of hands and feet, etc., when there is extreme cold; also by maintaining the circulation with movement, and (it is stated) by avoiding alcoholic drinks. But when F. has occurred the patient should be put in a cold room, and the parts affected should, in traditional practice, be rubbed with snow or covered with somewhat cold water. Sometimes the pain can be relieved by lifting the limb. Later there can be gentle rubbing with oil, but the longer the part has been exposed to the cold the more gradual must be the course of treatment. When the circulation has returned the part may be lightly wrapped in cotton-wool. A dressing of butter, charcoal, and camphor relieves the pain.

Symptoms.—Here are some of the symptoms described by the vivid pen of the Amer. Rear-Adm. R. E. Byrd, in *Alone* (1939). Byrd experienced F. in its most virulent form, near the S. Pole in 1934. 'Times when the temperature was in the minus fifties or sixties, a wind would come rustling out of the cold, edged with a breath so sharp that it fairly sliced the skin from the face. (He had chemical heat pads in his sleeping clothes, and under his furs in the daytime.) Mayho my toes would first turn cold, and then dead. Whilo I was dancing up and down to flex them and restore the circulation my nose would freeze, and by the time I had attended to that my hand would be frozen. The wrists, the throat where the helmet chafed, the back of the neck, and the ankles, pulsed and crawled with alternating fire and ice. Freezing to death must be a queer business. Sometimes you feel simply great.

The numbness gives way to an utter absence of feeling. You are as lost to pain as a man under opium. But at other times, in the enfolding cold, your anguish is the anguish of a man drowning slowly in fiery chemicals.'

Treatment.—It must be pointed out that there is difference between orthodox medical tradition and the treatment advocated by the explorer, V. Stefansson, who, in *My Life with the Eskimos* (1913), says: 'One of these superstitions is that, when your face or any other part of your body begins to freeze, you must thaw it out with an application of snow. Few things could be more absurd. Any high-school pupil could tell us offhand what would happen if liquid air were applied to a man's cheek or nose; of course the part would freeze instantly. The same would be true of the snow of carbon dioxide, and the same is true of snow or water, except, of course, that the freezing would not be so nearly instantaneous.' Stefansson's treatment was brief application of a warm hand to the part affected.

Frostburg, tn. in Maryland, U.S.A., in the Alleghany co. It is a popular summer resort, and lies in the midst of the coal region of the state. It has foundries and manufs. fire-bricks, and is the seat of a state normal school. Pop. 7600.

Frost Figures, or *Ice-flowers*, curved aggregations of ice-crystals, produced when hoar-frost is formed on a cold surface. The atmosphere contains a varying amount of water-vapour diffused in it. The amount of water-vapour depends on the physical configuration of a country, the prevailing winds, nearness to the sea, etc., and the capacity of the air for holding gaseous water increases with its temp. and pressure. When no more evaporation is possible the air is said to be saturated, and any decrease in temp. when this condition is estab. causes the deposition of the excess of water on any available surface. When the condensation of water-vapour occurs high in the atmosphere, the water is deposited around a dust-particle as nucleus; when it occurs at the surface of the earth, the water is deposited on the ground in the form of dew. Should the temp. drop to below 32° F. the water-vapour may be deposited as ice without passing through the intermediate liquid stage. In these circumstances small crystals of ice are formed, belonging to the hexagonal system of crystals. They have the habit of twinning; that is, two crystals may have a common face, but their axes may not be parallel. This phenomenon, when continued with crystal after crystal, produces a pattern of gradual curves, whose interpenetration and divagation produce a remarkable similarity to beautiful foliage.

Froude, James Anthony (1818-94), historian, was educated at Westminster and Oriel College, Oxford. After a distinguished career at the univ. he devoted himself to the composition of his *History of England from the Fall of Wolsey to the Defeat of the Spanish Armada* (1856-70). This was his greatest work, and brought him much renown; but, though most



SOME TYPICAL FRUITS

1. Cypselae—Head of *Olearia ilicifolia* in seed. 2. Cypselae—Single parachute seed of sainfoin. 3. Glans or Nut—Sweet Chestnut cupule open showing the three nuts. 4. Glans—Longitudinal section of nut of same. 5. Glans—A single nut of sainfoin. 6. Glans—Section of young fruit. 7. Capsule of *Euonymus europaeus*. 8. Capsule of saint-johns-wort open and empty. 9. Capsule of saint-johns-wort open, with seeds in position. 10. Samara—Single samara of sainfoin. 11. Samara—Single samara of Ash. 12. Samara—Double samara of Sycamore. 13. Samara—Section of half of sainfoin, showing enclosed cotyledonous leaves. 14. Legume—Pod of Broom, closed. 15. Legume—Pod of Broom, open. 16. Berry—Wild Gooseberry. 17. Berry—Section of same (transverse). 18. Carcerulus—Iruit of *Phlomis fruticosa*, with

admirably written, as a hist. it is not to be relied upon, F. being inclined rather to endeavour to support his own theories than to follow the facts elucidated by the documents from which he worked. Among his other books were *The English in Ireland in the Eighteenth Century* (1872-1874); *Orcana* (1886); *The English in the West Indies* (1888); *The Life and Letters of Erasmus* (1893); and *English Seamen in the Sixteenth Century* (1895). His friend Carlyle appointed him his sole literary executor, and in that capacity he pub. Carlyle's *Reminiscences* (1881); *History of the First Forty Years of Carlyle's Life* (1882); *Letters and Memorials of Jane Welsh Carlyle* (1883); and *Carlyle's Life in London* (1884). His biography of Carlyle was vigorously attacked, and gave rise to a controversy, which was revived in later years. F. was editor of *Fraser's Magazine* from 1860 for fourteen years. He was rector of St. Andrews from 1868, and regius prof. of modern hist. at Oxford, 1892-94. See A. Cooper, *James Anthony Froude* (a lecture), 1907; G. P. Gooch, *History and Historians in the Nineteenth Century*, 1913; W. H. Dunn, *Froude and Carlyle: a Study of the Froude-Carlyle Controversy*, 1930; and L. Strachey, *Characters and Controversies*, 1933.

Fructidor (fruit-month), twelfth month in the Fr. calendar inaugurated at the time of the revolution. The period extended from Aug. 18 to Sept. 16. The 18th F. of the year V. (Sept. 1, 1797) is celebrated as a day in which the republic was saved from the machinations of the Royalists.

Fructose, or **Laevulose** (fruit-sugar), discovered by Dubrunfaut in 1847. A ketose (*see SUGAR*), $\text{C}_6\text{H}_{10}\text{O}_5(\text{CHOH})_4$, $\text{CO}(\text{CH}_2\text{OH})_2$, contained in most sweet fruits, honey, and starched together with dextrose. Obtained pure by boiling inulin—a starch contained in dahlia tubers—with water, and together with glucose by the inversion of cane sugar. It is also obtained by hydrolysing sucrose with sulphuric acid. F. crystallises from alcohol, and has a melting point of 95°C . It is less easily fermented than glucosid, is a powerful reducing agent, and is laevo-rotatory (*see STEREOCHEMISTRY*). It is sweeter than cane sugar and is more easily assimilated. It can be obtained as a syrup or as a granular crystalline. It is used instead of cane sugar by sufferers from diabetes. It was synthesised chemically in 1897.

Frugoni, Carlo Innocenzo Maria (1692-1768), It. poet, b. at Genoa. At the age of fifteen he was sent to a monastery, and, though the act was repugnant to him, made to take monastic vows. In 1716 he was prof. of rhetoric at Brescian, and

afterwards taught at Rome, Genoa, Bologna, and Modena. He became poet laureate to the duke of Parma, and was released from his monastic vows by the pope. His lyrics and pastorals are remarkable for their facility and elegance, and he was also a very successful writer of Lat. poetical epistles, and of It. poems in the style of Ariosto.

Fruit, in the popular acceptation of the term, is a word of uncertain significance. In ordinary phrasology a plum, a strawberry, or an apple is called a F., whilst a pea-pod or a poppy-head is not so designated. When the structure of these plants is examined it is found that the latter are as true Fs. as the former. Botanically a F. may be defined as the fertilised gynoecium of a flower, together with those other adherent parts that become enlarged after fertilisation. Strictly speaking, true Fs. consist solely of gynoecial structures, those in which other substances are involved being more or less 'pseudocarps' or false Fs. The entire structure of a F. as distinguished from the seeds which it encloses is called the pericarp; this consists of three layers, distinguishable in a greater or less degree in different Fs. These layers are called the outer epidermis or epicarp, the inner epidermis or endocarp, and between them a spongy mesophyll or mesocarp. In pseudocarps the other structures contributing to the F. are mainly derived from the floral receptacle. In the strawberry the carpels, which form the apocarpous polycarpellary gynoecium, are scattered in numbers over a fleshy outgrowth from the conical white receptacle. In the apple the true F. is the core; in the cucumber the fibro-vascular bundles of the carpillary leaves form a ring near the inner surface of the fleshy portion. The terms pericarp, epicarp, mesocarp, and endocarp cannot be properly applied to the whole of the pseudocarpic structures. Fs. have been variously classified, and a great variety of names applied to the different forms; these, however, do not as a rule come within the scope of a scientific classification. The following classification is simple, though not free from objection, as succulence has undoubtedly originated independently in many different groups.

Dry Dehiscent Fruit.—In this class the F. dehisces or splits either into one-seeded portions or cocci, which do not themselves split, so as to discharge its seeds. Most capsules split with a valvular dehiscence, the side walls (pericarp) splitting in a longitudinal direction, and coming away in segments known as valves. If this splitting takes place down the dorsal sutures it is called loculicidal dehiscence;

part of calyx-tube. 19. *Carcerulus*.—Fruit of *Phlomis fruticosa*, splitting into four nuts or achenes. 20. **Drupe**.—Cherry. 21. **Drupe**.—Section of same, showing stone. 22. **Drupe**.—Complete sec. t.ion of same, showing kernel within stone. 23. **Pome**.—Crab-apple. 24. **Pome**.—Transverse section of same. 25. **Pome**.—Longitudinal section of same. 26. *Aëtario* of *Follick*. *Magnolia conspicua*. 27. *Aëtario* of *Follicles*.—Vertical section of same. 28. *Aëtario* of *Drupes*.—Blackberry. 29. *Aëtario* of *Drupes*.—Vertical section of same. 30. *Cynarrhodium*.—Dog rose. 31. *Cynarrhodium*.—Vertical section of same. 32. *Strobilus*.—Spruce Fir, closed cone. 33. *Strobilus*.—Spruce Fir, winged seeds of same, within scale. 34. *Strobilus*.—Weymouth Pine, open cone.

if down the ventral suture, septicidal dehiscence. With either of these modes of dehiscence the septa may be broken across in such a manner as to leave the seeds as a free central column on the placenta; this is termed septifragal dehiscence. Some dehiscent F.s., as those of the balsams and geraniums, split so as to throw their seed for some distance. Other capsules dehisce by teeth, the carpels splitting slightly at the apex, as in the cowslip (*Primula veris*), dianthus, etc. The legume splits down both sutures; the follicle down one only. In the pimpernel (*Anagallis*) the top of the capsule comes off as a round lid.

Dry Indehiscent Fruit. - Fleshy F.s. are usually indehiscent. The nut has a tough and leathery pericarp in the oak, chestnut, and beech, and a woody one in the hazel. An achene is a dry indehiscent one-seeded carpel; the caryopsis is the characteristic F. of grasses. The cypsela is the characteristic F. of the order Composite, and differs from achene in being syncarpous. The bicarpellary F. of the umbelliferæ is an inferior schizocarp.

Succulent Fruit. — The two main varieties of succulent F. are the berry, and the drupe or stone fruit. The characteristic of the former class is the succulence of the whole pericarp. To this belong the gooseberry, the grape, the currant, etc. The drupe is indehiscent, and its pericarp is generally divisible into three layers, the epicarp, the mesocarp, the endocarp (see above). The last, which forms the stone, is densely scleroclinymatous, and encloses the kernel. Stone F.s. are chiefly grown for their mesocarp; the almond is an exception, as in it the seed is of more value than the mesocarp. A knowledge of the flower and the process of fertilisation is necessary for the understanding of any F. See FLOWER; FERTILISATION; BOTANY.

Fruit-bat, name given to all members of the Pteropodidae, a frugivorous family found only in the tropical regions of the E. and in Australia; they are variously called flying-foxes, flying-bats, and fox-bats. The heads of many of them are curiously fox-like, and their hair is a reddish brown. *Pteropus edulis*, the great kalong, is the largest of all bats, measuring nearly 5 ft. across the wings. *Cynopterus marginatus* is the destructive and voracious Indian F.

Fruit Drunks, see under COOKERY.

Fruit, Drying of, see PRESERVING.

Fruit-farming, as distinct from market-gardening, comprises the cultivation of tree and bush fruit, including strawberries and raspberries. The agric. conditions, etc., are treated under the headings of the different fruits; a short account of the extent of F. in this country, and of the importation of fruit will here be given. The growing popularity of the fruit industry may be gathered from the fact that the Ministry of Agriculture returns concerning the fruit areas of Great Britain show a continuous increase. The total area in 1888 was 199,178 ac., in 1901 234,660, and in 1947 about 311,000. The following are the areas devoted to F. by certain Eng. cos.: Kent, 60,000 ac.;

Devonshire, 22,000; Worcestershire, 22,000; Herefordshire, 20,000; Somersetshire, 19,000; Gloucestershire, 14,000; Cumbrieshire and Isle of Ely, 11,000; Norfolk, 9000; Sussex, 5000; Essex, 5000; Lincolnshire, 4000; Cornwall, 4000; Suffolk, 3500; Middlesex, 3500; Shropshire, 3500.

The acreage under small fruit cultivation is about one-ninth of the total devoted to F. (approximately 61,700 ac. in 1938). The prin. small fruits grown are strawberries, currants, gooseberries, and raspberries, while loganberries have increased in importance. Among the prin. strawberry-growing cos. are Cambridge-shire, Hampshire, Norfolk, and Worcestershire. The following is the proportion occupied by the various small fruits: strawberries, 21,600 ac.; raspberries, 6600; currants and gooseberries, 34,000; other kinds, 4200.

The following is the average crop per ac. of some of the fruits: strawberries, 16.5 cwt.; raspberries, 22.3; red currants, 20.6; black currants, 19.4; gooseberries, 46.1.

Filberts and cobnuts have the disadvantage that they will not bear for four or five years, and do not reach their maximum bearing capacity for eight years. F. is an uncertain industry, and a moderate crop in a bad year will probably yield more profit than a good crop in a very good year, when the market will consequently be glutted. A large amount of labour is required, but in some cases the profits have compensated for this. It is, however, in the cultivation of fruit, principally grapes and tomatoes, under glass, that the largest fortunes have been made. About 12 tons of grapes and 20 tons of tomatoes may be grown to the ac. by this method. Owing to the perishable nature of the produce, few industries are more precarious in this respect, and great developments are possible in the direction of systematic marketing in the interest of the producer. Experiments have been tried with considerable success along co-operative lines, the growers in a dist. (as in the Pershore dist. of Worcestershire) combining to form a market of their own from which supplies can be forwarded with the minimum of delay and expense to places where the demand is good. Another development which considerably enhances the profitable character of F. and diminishes its risks is the provision of factories and other facilities for preserving the surplus produce by canning or one or other of the various methods outlined in PRESERVING.

The great proportion of fruit grown in the Brit. Isles is produced as a side line on farms and in market gardens, and fulfilling a highly elaborated system of marketing, within easy distance of a fruit farm, and fulfilling also a specially well suited climate and soil, this is undoubtedly the best method of undertaking fruit culture. The grower is then not seriously dependent on the vagaries of the season, and can usually make good use of a considerable part of the land occupied by the fruit crops, as by pasturing sheep in the

orchard, or by enclosing it in a series of poultry runs.

Importation of Fruit.—F. is carried on extensively in all the dominions and in many colonies, and in foreign countries. By the process of canning, and by the use of refrigerating chambers on board ships, fruit can now be transported to any part of the world. The importation of fruits to Great Britain increased before the Second World War contemporaneously with the increase in home-grown produce. The following table gives figures for the years 1938 and 1946:

See the articles on the various fruits, and GARDENING; and C. Whitehead, *Fruit-farming*, 1944; A. H. Hoare, *Commercial Apple Growing*, 1937; W. E. Shewell-Cooper, *Up-to-date Fruit Growing*, 1938; H. Dunkin, *The Pruning of Hardy Fruit Trees*, 1934; and N. B. Nagenal, (ed.), *Fruit Growing: Modern Cultural Methods*, 1945.

Fruit, Preservation of, see PRESERVING.
Fruit Sugar, see FRUCTOSE.

Frumentius, St. (c. A.D. 300–60), apostle of Ethiopia, b. in Phoenicia. He was captured by the Abyssinians, whom he

Fruit (fresh)	Quantity Imported		Value of Imports		Countries from which imported	
	Year		Year			
	1938 cwt.	1946 cwt.	1938 £	1946 £		
Apples	7,067,523	1,839,683	6,015,173	3,726,636	Canada, Australia, U.S.A., New Zealand, S. Europe.	
Apricots	40,717	7,914	62,841	83,382	U.S.A.	
Bananas	6,099,728	2,072,922	4,851,089	5,856,605	Brit. W. Indies, Brazil, Canary Is., Fiji.	
Grape-fruit	1,415,382	727,557	1,023,089	1,207,239	Palestine, S. Africa and Brit. Colonies.	
Grapes	867,281	540,069	1,729,707	5,796,556	S. Africa, Spain, Algeria, France, U.S.A.	
Lemons and Limes	1,012,872	454,051	870,917	661,358	Brit. Colonies and Italy.	
Oranges	10,765,257	5,312,557	7,491,011	11,138,358	Palestine, S. Africa, Brit. Colonies, Spain, U.S.A., Brazil.	
Pears	1,318,292	916,721	1,552,388	3,559,275	Australia, S. Africa, U.S.A.	
Plums, Greengages, and Damsons	317,295	214	512,021	3,528	Italy, S. Africa, Spain, U.S.A.	

Fruit, dried or otherwise preserved without sugar	Quantity Imported		Value of Imports		Countries from which imported	
	Year		Year			
	1938 cwt.	1946 cwt.	1938 £	1946 £		
Currents	1,050,395	163,009	1,153,622	377,391	Australia, Brit. Colonies, Greece.	
Figs and Fig-cake	87,257	116,676	131,197	316,569	Brit. Colonies, Turkey.	
Plums and Prunes	477,358	666,153	713,911	2,762,203	Brit. Colonies, U.S.A.	
Raisins	1,669,880	1,624,427	2,810,000	5,369,733	S. Africa, Australia, Brit. Colonies, Greece, Turkey, U.S.A.	

converted to Christianity, and he was consecrated bishop of Axum about 336. He is said to have trans. the Scriptures into Gez.

Frundsberg, Georg von (1473–1528), the great leader of the Ger. Landsknechts (free-lances) during the It. wars of Maximilian and Charles V., was b. at Mindelheim in Swabia. He fought for Maximilian against the Swiss in 1499, and in 1504 took part in the war in the Netherlands. In 1509 he won fame in the war against Venice, and in 1513 and 1514 was again occupied with the Fr. and Venetians. He gained a victory at Bicocca in Italy in 1522, was partly responsible for the defeat of the Fr. at Pavia, 1525, and suppressed a peasant revolt in Germany the same year.

Frunze, Mikhail Vassilievich (1885–1925), Russian revolutionary general, b. at Pishpek (renamed Fr., 1926), son of a peasant, settled in Turkestan and became a surgeon. Sent to Siberia 1911, but escaped, and again heard of at Minsk, 1917. Defeated Koltchak, 1919; fought Wrangel successfully, 1920. In 1924 president of the Revolutionary Military Council. In Jan. 1925 became people's commissary for military and naval affairs.

Frunze, tn. (formerly Pishpek) and region of the Kirghiz S.S.R., Russian Central Asia, 150 m. S. of S.W. extremity of Lake Balkhash. Grain is cultivated and there are cotton mills and tobacco factories. Pop. 97,000.

Frustum, portion cut off from any solid figure. The term is most frequently applied in the case of the cone, and conoidal surfaces of revolution. By 'frustum of a cone' is meant any part cut off from a cone which does not contain the vertex. This distinction is drawn because any part of a cone which contains the vertex is still a cone.

Fry & Sons, Ltd., J. S., oldest cocoa and chocolate firm in the world. Estab. 1728. Founded in Bristol by Joseph F., an eighteenth-century Quaker, who was also interested in the making of soap, pottery, and type-founding. Many large factories were erected for the business in Bristol, but these proved insufficient, and between the First and Second World Wars they transferred their activities to Somerdale, situated in the country between the cities of Bristol and Bath. To-day these factories house the most modern machinery, and the workers are employed under conditions which provide a pattern for all industry. The firm have been recipients of royal favour since granted letters patent in 1729 by George II.

Fry, Charles Burgess (b. 1872), Eng. athlete and journalist, educated at Repton School and Wadham College, Oxford; has played in international football and cricket matches; founder and editor of *Fry's Magazine*, and pub. *Cricket* in 1912. Honorary director of the naval training ship *Mercury*. He captained England's team in test matches, 1912. See his autobiography, *Life Worth Living*, 1939, 1948.

Fry, Sir Edward (1827–1918), Eng. judge, b. at Bristol. He was educated at

Univ. College, London, and London Univ. and was called to the Bar in 1854. From 1877 to 1883 he was judge of the high court chancery div., and in 1883 was made lord justice of appeal, but resigned in 1892. He presided over the royal commission on the Irish Land Acts, 1897–98, and was conciliator in the S. Wales colliery dispute, 1898. He was chairman of the court of arbitration under the Metropolitan Water Act, 1902; arbitrator between the London and N.W. railway company and their employees, 1908; and ambas.-extraordinary and first Brit. plenipotentiary to The Hague Peace Conference in 1907. He wrote *Essays on the Accordance of Christianity with Nature of Man*, *The Doctrine of Election* (1864), *James Hack Tuke* (1899), *Studies by the Way* (1900), and *The Liverworts* (1911). See Agnes Fry, *Sir Edward Fry*, 1931.

Fry, Elizabeth (1780–1845), prison reformer, was a daughter of John Gurney, the Quaker banker of Norwich, and was b. there. Married in 1900 Joseph F., also a Quaker, and member of the family of the founder of the Bristol cocoa firm (see *Fry & Sons, Ltd.*, J. S.). She devoted her life to endeavouring to alleviate the condition of those who suffered imprisonment. The conditions, especially in the women's prisons, were early in the nineteenth century only to be described as terrible, and it was mainly due to her efforts, which were as persistent as they were wholehearted, that the matter became one of practical politics, and thus, being dragged into the light, was made the subject of inquiry, and ultimately improved. She first visited Newgate prison in 1813, and in 1817 she formed an association for the improvement of conditions, and also extended her interests to continental prisons. There are biographies by her daughter, Mrs. Creswell, 1845; Susanna Corder, 1853; G. King Lewis, 1910; and Janet Whitney, 1947.

Fry, Mrs. J. P., see *KAYE-SMITH, SIR J. A.*

Fry, Roger Eliot (1866–1931), Eng. painter and critic; son of Sir Edward F. (q.v.). Educated at Clifton College and King's College, Cambridge Univ. Was a pupil of Francis Bacon and also studied in Paris. He first attracted attention by an exhibition of 'Post-Impressionist' paintings which he organised in 1911 and 1913, but the ensuing controversy left him unmoved, and it was to him that the belated recognition of Cézanne in Britain was due. He ed. the *Discourses* of Sir Joshua Reynolds (1905) and wrote monographs on Giovanni Bellini, Matise, and Paul Veronese; but his merits as an artistic philosopher will be estimated rather on such pubs. as *Vision and Design* (1920); *Transformations* (1927); and *Reflections on British Painting* (1934)—works of a speculative as well as of a critical nature. His last work, *Last Lectures*, was pub. posthumously (1933). For a time F. was curator at the Metropolitan Museum, New York, and in 1933 he was appointed Slade prof. of fine art at Cambridge.

Fryatt, Charles Algernon (1872-1916), Eng. master-mariner; b. at Parkesdon, Essex. In 1904 he was chief officer in the Great E. railway's Harwich-Rotterdam steamship service; in 1913, captain. When the submarine policy of the Ger. Gov. came into force Feb. 18, 1915, it became F.'s constant business to cross a war zone where his ship was liable to be sunk without warning. On the afternoon of Sunday, March 28, 1915, when navigating the S.S. *Brussels* from Parkesdon to Rotterdam, he was met by submarine *U33* near the Maas lightship. He disregarded the signal to stop, and steered for the submarine, which escaped by diving. The Ger. afterwards stated that he had allowed the *U33* to approach for inspection. On the night of June 23-24, 1916, steaming home from the Hook of Holland, the *Brussels* was captured by a torpedo-boat flotilla and taken to Zeebrugge. F. was tried (for his alleged offence of March 28, 1915) at Bruges, July 27, 1916, and shot the same day. His widow received a special pension, and his body was brought home to Dovercourt, July 7, 1919.

Fryth, John, see FRITH, JOHN.

Fryxell, Anders (1795-1881), Swedish historian, b. at Hesslekskog, Dal-land, Sweden. F. was educated at Uppsala and ordained in 1820. In 1821 he became doctor of philosophy at the univ. of Uppsala, and in 1840 was elected a member of the Swedish Academy. His chief work is *Berättelser ur Svenska Historien* (trans. 1844), a hist. of Sweden from the earliest times to the death of Gustavus III., which took forty-six years to complete. He also pub. a Swedish Grammar, the first systematic one in the language, *Conspiracies of the Swedish Aristocracy, The Literature of Sweden* (1860), and *History of my History* (1881).

Fuad I. (Ahmed Fuad) (1868-1936), king of Egypt, b. in the palace of Gizeh; youngest son of Khedive Ismail Pasha. After his father's fall he went to Italy and studied at the military academy and artillery school at Turin. On return to Egypt married May 30, 1896, Princess Shivekar (b. in Constantinople)—they had one daughter, and were divorced. In 1917, on the death of his elder brother, Sultan Hussain Kiamil, F. became sultan, and the Brit. protectorate coming to an end, he was proclaimed king March 16, 1922. Married 1919 Princess Nazli—they had one son and three daughters. In 1927 he visited European capitals. In 1928 the constitution was suspended, but restored in 1929, in which year the king was in England and a treaty with that country was signed.

Fuad Pasha, Mehemed (1814-69), Turkish statesman, b. at Constantinople. He entered the civil service about 1836, and became secretary of the embassy in London. In 1851, and three times thereafter, he was made minister of foreign affairs, and in 1861 was appointed grand vizier. He commanded the troops on the Gk. frontier during the Crimean war, and also accompanied the Sultan Abd-ul-Aziz on his journey to Egypt and Europe. He

ably managed the foreign affairs of Turkey, and was remarkable for his bravery and promptness of decision, as well as for his wit.

Fuchow: 1. City in China, cap. of the prov. of Kiang-si, an important seat of trade in native paper. 2. Tn. of Manchuria in the prov. of Liaoning on the E. shore of the gulf of Liaotung, S. by W. of Newchwang (Yingkow).

Fuchow (Fukien), see FOCHOW.

Fuchs, Leonhard (1501-66), Ger. botanist, b. at Memmingen, Bavaria. He studied classics at Ingolstadt under Reuchlin, and became prof. of medicine at Tubingen in 1535. Soon he took up the pursuit of botany, of which he must be looked upon as one of the fathers. His most important work on the subject is *De Historia Stirpium Commentarii Instigines* (1545). This work is beautifully illustrated, and gives a clever description of domestic plants alphabetically arranged. In it F. laid the foundation of a permanent botanical nomenclature. The fuchsia was named after him.



FUCHSIA

Fuchsia (Neo-Lat., named after Leonhard Fuchs (q.v.)), a genus of plants of the family Onagraceae, containing more than fifty known species, mostly natives of tropical America. The majority are shrubs, but some are arorescent or climbing. The flowers are generally pendulous, four-petaled and of a brilliant and delicate colouring, red, purple, and white, pollinated by humming-birds. The leaves are opposite and verticillate. Fs. are much cultivated as greenhouse plants, and a certain small-growing variety is a common outdoor plant, which flourishes over a wide area in the Brit. Isles where the climate is not too vigorous.

Fuchsia aniline dyestuff of a magenta or red color, consisting of a mixture of the hydrochlorides or acetates of para-rosaniline and rosaniline. In commerce F. is known by various names, such as

magenta, aniline, rubino, roseine, etc., and it is widely used for dyeing purposes. Occasionally it is also employed for the colouring of confectionery and wines.

Fucino, Lake of (Lat. *Lacus Fucinus*), lake bed of the Abruzzi, Italy, in the prov. of Aquila. The level of the lake was subject to great variations, owing to lack of an outlet, and disastrous consequences were frequently the result of this. It was 37 m. round and 65 ft. deep. In A.D. 37 the Emperor Claudius constructed a tunnel 3½ m. long by which the surplus waters were carried to the Idris. It is uncertain when it finally went out of use, but various attempts were made to reopen it from 1240 onwards. In 1876 the lake was finally drained and the bed is now cultivated.

Fuegians, aborigines of Tierra del Fuego. They are divided into three distinct groups, viz. the Onas, the Yahgans, and the Alacalufs, in the E., centre, and W. of Tierra del Fuego respectively. The Yahgans are the true aborigines, closely allied to the primitive long-headed races of the new world. Very little is known of the Alacalufs, but they are probably of Araucanian descent. The Onas are similar to the Tobuelche Patagonians in their tall stature and the nomadic life they lead. The F. have dark brown, copper-coloured skins, and plentiful black coarse hair, their heads being particularly developed. They hunt and fish to supply themselves with food, and live in huts formed of tree-trunks and branches. They obey no chief, and do not appear to believe in a future life, though they are afraid of invisible beings and spirits. See E. Lucas Bridges, *Utmost Part of the Earth*, 1948.

Fuego, Tierra del, see TIERRA DEL FUEGO.

Fuelling Stations. Wide commercial interests of Great Britain have long made it essential that ample stocks of fuel should be stored at convenient ports along the chief routes to the Far East and Australia, for the service of the R.N. and the Mercantile Marine. As long ago as 1878 a royal commission was appointed to deal with the whole subject, and on the basis of this commission's report in 1881 adequate arrangements were made for the provision of suitable stations, especially for the service of ships travelling to and returning from the Far East. In 1889 the widening of the Suez Canal was completed, and the old journey around the Cape became no longer necessary, and, in consequence, additional ports had to be provided which involved new arrangements at Port Said, Suez, and Aden. As a great deal of anxiety was expressed concerning the unprotected nature of these F.S. in time of war, a Naval Defence Act was passed in 1889, under which powers were granted for the provision of protection from attack by sea. Further uneasiness arose on the development of aircraft during the First World War, and efforts were concentrated on giving protection to these stations against aerial attack. In the old days F.S. were practically coal stores, estab. at convenient

points, but of recent years the substitution of oil for coal as a fuel has proceeded at a great rate, so that these ports have become chiefly oil depots. This in turn has had its effect upon the Mercantile Marine, in which tankers have taken the place of colliers to a remarkable extent. At the beginning of the First World War there were under 1,500,000 gross tons of oil tankers. When war again broke out in 1939 the total had grown to nearly 11,000,000 tons. The biggest of these ships can carry 16,000 tons of liquid cargo. There were then estimated to be 2000 vessels entirely devoted to carrying oil, nine-tenths of which were themselves oil steamers.

Fuel Research Board. The F. R. B. of the Dept. of Scientific and Industrial Research was estab. in 1917, with Sir George Beilby (q.v.) as the first director. The board, in its first report, stated that the two main lines of research envisaged were, in the first place, a survey and classification of the coal seams in the various mining dists. of Great Britain by means of chemical and physical tests in the laboratory, and, in the second place, an investigation of the practical problems to be solved before any large proportion of the raw coal burned could be replaced by the various forms of prepared fuel obtainable from coal by carbonisation processes. A fuel research station was constructed at E. Greenwich, containing the necessary plant, laboratories, and offices. This has been extended as occasion has demanded and now includes horizontal and vertical retort plant and also low-temp. plants. The Survey of the National Coal Reserves still forms an important part of the board's work, while useful work has been carried out on low-temp. carbonisation. In addition much other useful work has been done and the results are available to the public in the form of excellent cheap technical papers pub. by H.M. Stationery Office. The present (1949) director of fuel research is Dr. A. Parker, and the chairman is Sir Harold A. Brown.

Fuels may be described as almost invariably carbonaceous materials which give rise to the phenomenon of heat in combining with oxygen. The carbon and hydrogen which are contained in the F. unite with the oxygen of the air to produce a greater or less amount of heat, according to the properties of the fuel and the manner in which it is burnt. The amount of heat which a fuel gives out during combustion naturally has a great influence on its value for commercial purposes, and this will be considered in detail. With regard to their origin, F. may be divided into three classes: natural, prepared, and liquid and gaseous F. To the first class belong wood, peat, lignite, and all kinds of coal; to the second belong compressed F., such as briquettes, etc., prepared peat and wood, charcoal, and coke; in the third class are found petroleum and its extracts, alcohol and certain hydrocarbons, such as benzol and naphthalene, coal gas, natural gas, water gas, and producer gas. From the point of view of

composition, the F. in the first two classes above fall into the category of solid F., liquid F. form a second class, and gaseous F. a third.

The combustible portions of all F. consist of one or more of the following ingredients: free carbon, free hydrogen, and carbon combined with one or more of the elements hydrogen, oxygen, and nitrogen. The heating or calorific power of a fuel is the quantity of heat generated by the combustion of a unit weight. The heat is measured in units; the standard unit now adopted in this country is called the Brit. Thermal Unit (B.Th.U.), and is the quantity of heat required to raise 1 lb. of water by 1° F. when at its maximum density, i.e. from 39.1° to 40.1° F. The scientific unit of thermal value is the calorie, which is the amount of heat required to raise a unit weight of water (at 39.1°) 1° C. Heat may be stated in calories or B.Th.U. for comparative and calculating purposes, but to engineers the evaporative duty of the coal is of the most importance, and this is usually stated as so many pounds of water at 100° C. (212° F.) converted into steam at the same temp. In the case of tn. gas, to facilitate calculation, the "therm" was introduced by the "Regulation Act. One therm is equivalent to 100,000 B.Th.U.s.

An important point with F. is the quantity of inorganic matter they contain, as this constitutes the ash, the amount of which is an important factor in the suitability and economy of the F. In addition to the F. enumerated above, various kinds of vegetable refuse, such as brushwood, straw, cotton, stalks, etc., are used for heating purposes where better fuel is lacking. In various parts of France and Germany tan cakes made of the spent bark used by tanners are employed as fuel. A common fuel in India and Egypt is the dung of camels and oxen, which is moulded into thin cakes and dried in the sun; these have very little calorific power, and are characterised by an acrid ammoniacal vapour during combustion. The salient characteristics of the various F. are briefly as follows:

Wood.—The value of wood as a fuel varies with the amount of moisture therein and the ash which remains after combustion. Even after prolonged drying wood will contain from 17 to 20 per cent. of moisture. The percentage of moisture in a few varieties of fresh-cut wood is as follows: Hornbeam, 18.6; sycamore, 27; oak, 31.7; pine, 39.7; elm, 44.5; larch, 18.6; poplar, 51.8. The percentage of ash in wood is on the average between 2 and 3. The calorific value of wood is low, as much heat is required to consume the moisture, and the percentage of hydrogen is very low. The charcoal which is made from wood has about a quarter of the weight of the wood used, and double the calorific value of an equal weight of wood.

Peat is formed of vegetable matter, such as mosses and aquatic plants, which, by the agency of pressure, have in time become converted to the spongy brownish-

black substance which is found in peat bogs. When cut out in square blocks and air-dried in the usual manner, its calorific power is roughly equal to that of wood. When the peat is excavated and compressed into briquettes by machinery, however, a really valuable fuel is produced which will bear comparison with the best coal. Peat represents an intermediate formation between wood and coal.

Coal may be classified into three main varieties: Lignite, bituminous, and anthracite. Lignite or brown coal is the least carbonised of any coal, showing indications of organised structure, and containing a considerable proportion of hydrogen and oxygen. Most of the coals found in the Brit. Isles are bituminous in character; there is a larger variety in this class of coal, which includes steam coals, coke and furnace coals, gas coals, and household coals. The coals which are most used for the house and general use are non-caking long-flame coals. From 70 to 80 per cent of carbon is contained in them, but little available hydrogen; their specific gravity is about 1.25. The coals which are most used for the manuf. of gas contain from 80 to 85 per cent of carbon, with a sp. gr. of about 1.3. Coking and furnace coals burn with a smoky flame of varying luminosity, and contain in some cases nearly one-third of volatile hydrocarbons. The best steam coals are anthracitic in character, being difficult to ignite and without much tendency to smoke. The sp. gr. varies from 1.34 to 1.41, and the percentage of carbon from 90 to 93. Anthracite coals are hard and dense in character, with a metallic lustre. Intense heat without flame or smoke is generated by anthracite, but as a powerful draught is required and ignition is difficult it is chiefly used in furnaces and engineering works. The sp. gr. of anthracite varies from 1.4 to 1.6, and the percentage of carbon is as high as 98.

Coke has been prepared from coal for many years, but it was not until 1800 that the preparation of coke was carried out on scientific principles, great improvements being effected. For many metallurgical processes coke is specially prepared in coke ovens from well-washed small coal. The chief requisites of a good coke are strength, insusceptibility, a low percentage of sulphur, and a high calorific power. The constituents of a first-class coke should be, 92.98 per cent carbon, 5.22 per cent ash, 1.3 per cent oxygen, .27 per cent sulphur, and .23 per cent nitrogen. According to theoretical calculations coke should be slightly more efficient from a heating point of view than coal, but in actual practice the results are about equal. There are certain varieties of coal which can be used most economically, for firing boilers, furnaces and kilns, when in a powdered form. As a result pulverised fuel has developed considerably of late.

Liquid Fuel.—The use of liquid F. may be said to date from the middle of the nineteenth century. Of late years their use has greatly extended for steam raising

and small furnaces, as well as for internal combustion engines. The various petroleum distillates and residues represent the chief source of liquid F.; alcohol is also used, but to a less extent. The lighter extracts of petroleum, such as petrol, are well suited for high-speed internal combustion engines, such as are used in motor-cars, whilst the heavier residues are suited for producing heat for other engines, etc. At the present time Russia, Iraq and Iran, the Dutch E. Indies, and America supply most of the petroleum of the world, but oil has been found in many other places. Most fuel oils have about 85 per cent of carbon, from 10 to 13 per cent of hydrogen, and the remainder of oxygen, etc. Weight for weight the heating power of petroleum is about one-third greater than that of good coal. The following table gives some particulars about the chief varieties of oil fuel (reproduced by permission of Messrs. Constable & Co., from V. B. Lewes's *Liquid and Gaseous Fuels*).

fugal action which sprays it in an exceedingly fine condition. In the Swenson injector the oil is forced out in a jet on to the point of a V-shaped metal cutter, which divides it into very fine spray. In the second class of injectors the usual method is that the oil is led down into the injector by the force of gravity and there meets a steam jet which drives it out from the nozzle of the injector with a high velocity and in a fine state of div. The outrush of steam and oil is usually allowed to such in the air around the jet to aid in the combustion. Among the best known types of this class of injectors are those of Holden on the Brit. Railways, those of Messrs. Rushton & Keles, and those manufactured by Messrs. Armstrong, Whitworth & Company, invented by E. L. Orde. When liquid fuel is atomised by an injector, the burning vapour as it rushes out is generally brought into contact with either a layer of fuel or brick-work near the mouth of the furnace; or in some cases the furnace is bricked all the

	<i>Specific Gravity</i>	<i>Flash Point</i>	<i>Calorific Power B.Th.U.</i>	<i>Actual Evaporating Power from and at 212° F.</i>
American Residuum	.886	350	19,627	15
Russian Ostatki	.956	308	19,410	14.8
Texas	.945	214	19,242	14.79
Burma	.920	230	18,864	14.5
Barbados	.958	210	17,718	14.2
Borneo	.936	285	18,531	14
Shale Oil	.875	288	18,217	13.8
Blast Furnace Oil	.979	206	16,080	12
Heavy Tar Oil	1.084	218	16,050	12

The chief advantages of liquid F. are (1) greater calorific power and less weight; (2) occupies less space; (3) convenience of storing and loading; (4) greater speed in getting up steam; (5) complete control over combustion. Against these must be set the danger of explosion of stored oil, loss by evaporation, and in some localities increased cost. In oil engines the vapour of the oil is exploded with air in the cylinder, the heat thus generated providing the motive power. When used for producing heat the petroleum is injected into the furnace in the form of a spray. The most generally used method now consists of the direct atomisation of the oil so as to drive it direct into the furnace chamber in spray which is so finely divided as to act almost as a gas, thus ensuring complete combustion. This atomising action is carried out either by forcing the oil out from a jet at a considerable pressure, or by injecting it with steam, or air, or a combination of the two. The Kortling injector is a good type of the first method. The oil, at a temp. of 130° C. is forced into the injector at a temp. of 50 lb. to the sq. in. When inside the injector the oil flows into a chamber feeding the jet, which is fitted with a spindle carrying a spiral screw. The oil is forced down this screw, and acquires a centri-

way round. Brickwork when so used should be jointed so as to allow plenty of room for expansion or it will become buckled and the out-side will fuse. It becomes heated to a very high temp., and helps to ignite the oil vapour and air which enter the furnace; if the oil jet is made to dash against it, it serves to disintegrate and gasify it; it also prevents the flame from passing too rapidly through the furnace and saves the plates from the direct impact of the former. For this purpose various forms of brick baileys are also used.

Gaseous Fuels are now used in many metallurgical processes, as in the Siemens-Martin steel process. Re-heating and other furnaces also use gaseous fuel; and in the various types of gas engine gas is extensively used as a prime motor. Large quantities of combustible gases are obtained from the earth in the U.S.A., Russia, China, and other places; these are known as 'natural' gases. The natural gas found in Pennsylvania and Baku contains from 80 to 90 per cent of methane, and is the most valuable of gaseous F. from a calorific point of view, but the supply is diminishing.

Manufactured gases are of four main varieties: (1) Coal gas, produced by the distillation of coal in closed retorts; (2)

water gas, made by the action of steam on incandescent carbon; (3) generator or producer gas made by the passage of air through incandescent carbon; (4) mixed producer and water gas, called semi-water gas, made by the passage of both air and steam over highly heated fuel. Coal gas is used for lighting, heating, and cooking purposes and for gas engines; it is much in favour for both power and fuel purposes. When used for the latter purpose it is burnt at a very high temp., mixed with air in atmospheric burners; important features are the absence of mess, dirt, and smoke, and the ease and exactitude with which it can be regulated. Water gas depends for its formation upon the fact that at a high temp. carbon has a greater affinity for oxygen than has hydrogen, and that when steam and carbon in any of its amorphous forms are heated to such temps., the steam is decomposed, with liberation of either carbon monoxide or carbon dioxide, according to the temp. and the quantities of steam and carbon interacting. The value of water gas thus produced depends on the closeness of the approximation to ideal conditions. Water gas is largely used for welding and other engineering works, and when mixed with the gases formed in the decomposition of various grades of oil, forms the basis of carburetted water gas. Water gas is also used as the starting material in the manuf. of many important chemicals. Producer gas, which possesses the least thermal value of the four varieties, is a mixture of carbon monoxide and nitrogen. Air is passed through a column of heated coke, when the carbon at the lower surface thereof combines with the oxygen of the air to form carbon dioxide; this is turned into carbon monoxide by contact with the heated carbon over which it has to pass, and, in combination with the residual nitrogen from the air, forms producer gas. Siemen's producer gas differs from ordinary producer gas in that small coal or slack is used instead of coke. The gas thus produced has a higher thermal value. Mond's gas is an extremely cheap form of producer gas, made from a cheap bituminous coal slack. Arrangements exist in the process for the recovery of ammonia, which in other producers is wasted, and a sufficient quantity is recovered to pay for the fuel used, thus compensating for the low calorific power of the gas. The large amount of carbon dioxide and nitrogen present accounts for the low thermal value of producer gas. Gas generators which work on the suction system find considerable use for the working of gas engines. The charge of gas is drawn into the engine directly from the producer, in which a mixture of air and steam is drawn over red-hot anthracite. The cylinder is in direct communication with the producer, and the back stroke of the piston causes a fresh mixture to be drawn over the anthracite. A cheap form of gaseous fuel is thus obtained, when required, by a self-contained plant.

A large number of gas generators is now made in which air and steam are simultaneously passed through incandescent F.

in such proportions that the formation of producer gas, by the partial combustion of the carbon and the hydrogen of the air, raises the temp. in the same ratio as the decomposition of the steam, by the red-hot carbon, into water gas, lowers it. Thus a uniform temp. obtains in the generator, and a gas is produced which is practically a mixture of generator or producer gas with water gas, but which has a higher calorific value. The systems of Wilson, Dowson, Dawson, and Duff are based on this principle. The gases which until recently were blown to waste from the mouth of gas furnaces are now made use of, and have been shown by Bryan Donkin to be suitable for specially constructed gas engines. In the case of furnaces in general, increasing use is being made of the so-called "waste-heat" of the products of combustion. The heat is generally recovered by passing the gases through fire-tube boilers.

The heating value of a gaseous fuel can be calculated by assigning to each constituent its calorific value, when the proportions of the mixture of combustible gases in the fuel are known by chemical analysis.

Analysis does not reveal the manner in which the hydrogen and oxygen are combined with the carbon, but merely the percentage of each element present; the heating value cannot therefore be calculated from analytical data with any degree of accuracy. An experimental determination is thus not only the simplest, but also the only reliable method of finding the calorific value of a solid or liquid fuel, and as an exact chemical analysis of a mixture of gases is tedious and difficult operation, the experimental method is better in the case of a gaseous fuel.

Instruments for finding the heating value of a fuel are known as calorimeters. In all calorimeters the method adopted is to burn a weighed quantity of the fuel in oxygen so as to impart the heat produced to a known quantity of water. The many varieties of calorimeters differ in the method of carrying out the combustion of the fuel and of imparting the heat to the water, but may all be referred to one or other of three types. (1) Where the combustion of the fuel is effected with the admixture of a solid oxidizing agent, as is done in the Lewis Thompson calorimeter. (2) Where the combustion is carried out in oxygen at constant pressure; (a) when the temp. of the escaping gas is undetermined, as in the Wm. Thompson calorimeter; (b) when the temp. of the escaping gas is under control, as in the Fischer calorimeter. (3) Where the combustion is carried out with oxygen at constant volume, as in the Berthelot, Mahler, Mahler-Donkin, or Mahler-Krooker calorimeters. The bomb calorimeter, belonging to the third class, is the most accurate, but that of Lewis Thompson is the most widely used, although the least accurate, as it is very easy to manipulate. All the above calorimeters are primarily designed for solid F., and if liquid F. are to be tested, the platinum crucible or holder should contain kieselguhr, on to which the

oil should be dropped. For testing the heating power of a gaseous fuel a Simmance-Abady calorimeter is one of the best; this is a modification of the original Junker calorimeter.

With the introduction of the Gas Registration Act, recording calorimeters, which give a continuous record of the heating value of the gas, have come into use. These ingenious instruments correct automatically for changes in barometric pressure, temp., humidity, and sp. gr. of the gas. The most important types are the Fairweather and the Thomas. The Simmance-Abady calorimeter is easily modified for use with light oils, alcohol, etc., a small lamp on a sensitive balance is used instead of a gas burner and meter. For further details see the articles on FISCHER-THORSCHE PROCESS, GAS, HEAT, COAL, and CARBONISATION, and the various gasses herein mentioned. See also E. J. Mills and F. J. Rowan, *Fuel and its Application*; P. Bateson, *Fuel Purification*, 1891; Sir E. Lowthian Bell, *Gaseous Fuel* (J.I.S.I., vol. II.) 1889; R. Galloway, *Fuel*, 1904; H. L. Payne, *Fuel Value of Gases*; V. B. Lowes, *Oil Fuel*, 1913; J. Braine, *Fuel: Solid, Liquid, and Gaseous*, 1919; J. H. Nicolls and C. B. Mohr, *Fuel Analysis*, 1934-36, 1937; and E. Wright and H. F. P. Purday, *Diesel Engine Fuels and Lubricants*, 1949.

Fuente Ovejuna, tn. in Spain, 45 m. N.W. of Córdova. It has mines of argentiferous galena, and one of its principal industries is meat-curing. It also produces a quantity of honey. Pop. 17,000.

Fuenterrabia, or **Fontarabia** (Fr. **Fontarabie**), fortress in Spain in the prov. of Guipúzcoa, at the mouth of the R. Bidassoa, on the Fr. frontier, 9 m. from San Sebastien. In 1638 it was unsuccessfully attacked by the Fr. under the duke of Berg. In 1813, however, Wellington succeeded in crossing the Bidassoa, near the tn., although strongly opposed by Soult. Milton confounds F. with Roncesvalles. Pop. 5500.

Fuero (Lat. *forum*), in Sp. law a term of wide import, but generally used to denote (1) General codes of law, or bodies of customs, such as the F. Viejo of A.D. 990 and the F. Juzgo; and (2) special tribunals having jurisdiction in cases relating to certain depts., such as the army and navy, or the post office. The F. Juzgo was the code of laws established by the Visigoths as the *forum judicum*, and which later, after the reconquest of Spain, in the middle of the thirteenth century, by the Christians, continued to be administered by separate courts and judges for the Mozarabs, i.e. Christians who had lived under Muslim rule and assimilated themselves to the Arabs. This F. applied to Mozarabs wherever no provision was made by royal privilege, or by special charters, or Fs., as they are also called, such charters or Fs. being, as in medieval England, privileges granted to cities or tns. in consideration of the payment of dues to the owner of the land. No common tribunal administered the F. Juzgo, and it was subject to a great number of local jurisdictions. Many of its provisions

are still in force, but a number of unchartered tns. in 1280 adopted the F. Real, a code promulgated by Alfonso el Sabio in 1255, as a preliminary to a larger digest or code called *Las Siete Partidas*. But the latter, even when formally promulgated a century later, was expressly made subject to all existing Fs. The F. de Salamanca was a code of civil law promulgated in the beginning of the twelfth century for Salamanca, and there were a number of other such municipal Fs. for the government of different tns. and the administration of justice in them. Spain was early the home of a highly specialised local gov., acknowledging scarcely any relation to a central administration. In the provs. these written or unwritten codes of laws relating to legislative, judicial, and administrative functions were called Fs. or *fors*; those of the tns., *cartas-pueblos* (tn. or vil. charters). Like the common law of England, or rather the special customs (see under COMMON LAW; CUSTOMS; CONSUELTUDINARY), these Fs. owed their strength to their immemorial antiquity, although unlike Eng. customary law they owed their formal recognition to some royal grant or grant by a lord paramount. As in England some Sp. monarchs, e.g. the Castilian, were bound on their accession to swear to observe the Fs., but when Spain became united under an absolute monarchy, most of the Fs. were openly violated, one marked exception, however, being the Fs. of the Basques. See F. M. Marina, *Ensayo histórico-critico sobre la antigua legislación y principales cuerpos legales de los reynos de León y Castilla*, and M. de Colmeiro, *Curso de derecho político segun la historia de León y de Castilla*, 1873.

Fuerte Ventura, or **Fortaventura**, one of the Canary Is., in the I. of the archipelago, separated from Lanzarote in the N. by the channel of Bocanilla. Cap. Botanera near the W. coast. Pop. 13,100.

Fueslli, Johann Heinrich, see FUSELI, HENRY.

Fugger, Swabian trading family, who lived at Augsburg, and who became so wealthy that they frequently financed the military expeditions of Ger. monarchs. The founder of the family was Johann (or Hans) F., a master weaver of Graben, near Augsburg. His son, Johann, became a citizen of Augsburg by marriage and an assessor of the dreaded Fehnigericht (see FEHMIC COURTS). His eldest son, Andrew, known as 'the rich Fugger,' became the founder of a noble line, F. von Reh, which became extinct towards the end of the sixteenth century. Jacob, the second son of John, and the first of the family who owned a house in Augsburg, became head of the guild of weavers. His sons, Ulrich, George, and Jacob, all men of great energy and resource, enormously increased their patrimony—Ulrich as a trader of varied operations, and Jacob by exploiting the Tyrolean mines to such purpose that he lent the Archduke Charles of Austria 150,000 florins and built the castle of Fuggerau. All three brothers married women of rank and were themselves on-

nobled, by Maximilian For a large loan this monarch mortgaged to the brothers the properties of Kirchberg and Weissenhorn Jacob (d. 1525) founded in the outskirts of Augsburg the Fuggerei, a settlement of about fifty double dwelling houses for needy people Jacob and the sons of Ulrich d. without issue, so that the family property passed to the sons of George In consideration of the help rendered to him in the early sixteenth century by the two brothers Raimund and Antonius, sons of George I King Charles V gave them the mortgaged properties mentioned above, and ceded them counts with princely

refuge in some other part of the British Empire, may be arrested and brought back under the Fugitive Offenders Act, 1881, either (a) upon a warrant duly endorsed by the colonial governor, or by a judge of the supreme court in the colony to which the offender has fled, or (b) upon a provisional warrant issued by a colonial magistrate upon such evidence and in such circumstances as would justify such a warrant if the offence had been committed within such magistrate's jurisdiction These provisions extend also to countries to which the Foreign Jurisdiction Act (q.v.) apply but where the



German State Art & Crafts Tourist Dept.

THE FUGGERI, AUGSBURG

Sixteenth century

privileges. Later after they had financed his expedition against the Algerian pirates the king gave them the right to issue their own gold and silver coinage. Notwithstanding their exiled rank they continued their mercantile activities and Antonius (d. 1560) left a fortune of 1,000,000 gold crowns in addition to other assets in various continents. Raimund (d. 1535) and Antonius were founders of two great lines which were continued to modern times. The fortunes of the Fugger family are some indication of the prosperity of Germany before the country was nearly ruined by the Thirty Years war. There are memorials to the Fugger family in Augsburg. See R. Hrenburg, *Capital and Finance in the Age of the Renaissance, a Study of the Fuggers and their Connections* (trans. 1928).

Fugitive Offenders Act, 1881 A person who has committed a crime in the British Isles, and who, to avoid arrest has taken

offender he escaped to any other foreign country, he can only be got back under the terms of an extradition treaty. If the magistrate before whom the fugitive is brought thinks there is *prima facie* evidence of guilt, he may commit or send the accused back for trial to the country or place where he is alleged to have committed the offence (*for us delictum commisum*). When at the *locus delicti* the accused is entitled to a trial within six months and if not tried within that period, or if acquitted, he is entitled to be paid his escape money back either to the place of arrest or his intended destination at the time of arrest. In any case if not sent back for trial within one month of commitment he is entitled to be discharged. The magistrate hearing of a case under this Act must be at Bow Street police court and in Scotland before the sheriff of Edinburgh. By an Act of 1915 persons may be arrested for treason and other

crimes, in any of the colonies and protectorates, and vice versa. See Earl of Birkenhead, *International Law* (6th ed.), 1927.

Fugitive Slave Laws In the U.S.A., prior to the constitution, there were no F.S.L. it being left to the comity (*q.v.*) of the different states or colonies to surrender slaves who had escaped from the places where they were held to service. In 1787 the different slave holding states inserted provisions in their constitutions regulating the surrender of fugitive slaves and these provisions later found expression in the federal constitution and in 1850 Congress strengthened the provisions by regulating the mode of arrest, trial, and surrender of fugitive slaves. This Act was repealed in 1864. The

being fully exploited by means of canon, syncopation, and the introduction of episodes, the section works up to a climax over a pedal point, usually the dominant, and so leads to the recapitulation. In this section the material is greatly elaborated by various polyphonic devices, the whole work being thus brought to a conclusion in a passage of vigour and intensity (*trillo*). Although in my sixteenth century experiments were designated by the title of *fuga* they were nothing more than canons, it was not until the latter part of the seventeenth century that the true F. was accomplished. The greatest master of F. was J.S. Bach who not only wrote many fine organ L.s. which have not been surpassed but also originated the pianoforte F. in his



THE CRUSE OF FUJI SAN
A photograph from H. G. Ponting's *In Lotus Land*

I.S.J. are now of merely historical interest as the amended constitution prohibited the slave trade altogether. In England at a time when the status of serfdom existed (*glebae adscriptus* attached to the soil), it was a generally recognised principle that a serf who succeeded in evading recapture for a year and a day obtained his freedom and further in England a serf could always purchase his freedom. No analogous provisions are to be found in the old Amer. L.S.L. It may be said indeed that the constitutional freedom of the slave subjected room for F.S.L.

Fugue, highest to i. of contrapuntal art, and the aesthetic and technical climax of the possibilities of the polyphonic school of music. It commences with the statement of a subject by one part followed by the statement or answer by a second part, during which the first proceeds with a counter subject, the third and succeeding parts being introduced in the same manner. When all the parts have been brought in, a free fantasia follows, in which the subject is developed at length, its contrapuntal possibilities

Hochtemperite Klavier (1722-41) whilst the early eighteenth century masters of B.H. and H.M. contain some excellent examples of the choicer F. See G. Oldroyd *The Technique and Spirit of Fugue*, 1914.

Fuhnen, see LUNEN

Fuh-Shan, see TAIHSIEN

Fuji-San, **Fujino-yama**, or **Fujiyama**, highest mt. in Japan (about 12,300 ft. high) visible from Tokyo, 60 m. distant. It is a regular snow-capped volcanic cone, and is a favourite subject with Jap. artists. The last eruption occurred in 1707.

Fujiwara, see JAPAN, History

Fukien, maritime prov. in China bounded on the S. by the Chihli Sea and on the other sides by the provs. of Khekiang, Kiungsing and Kwangtung. Its area is 15,833 sq. m. The surface is very mountainous and the prov. is noted for its beauty, the mts. clad with timber and shrubs, forming a picturesque background. The prin. riv. is the Minklung, which enters the sea below Foochow, the cap., which is celebrated for its fruits, and produces a considerable quantity

of ginger. The prov. produces tea, camphor, tobacco, sugar (cultivated in the irrigable country), indigo, and alum, which form its chief exports. The prosperity of Taiwan (Formosa) has spellt the decline of F., especially in the tea trade, though there is still a fair trade in flower-scented teas and in camphor production. But there is a good timber industry, the chief woods being fir, rosewood, and pine; and paper is manufactured from bamboo pulp. The mineral resources include coal and iron and the precious metals. Clay for the porcelain manufs. of Min ware is also important (see CHINA—*Chinese Art*). The coast people are engaged in trading and fisheries. The prov. was controlled by Japan until its liberation at the close of the Second World War. Pop. 11,101,000.

Fukui, tn. and prefecture in Japan, near the N.W. const. of Honshu, 86 m. N.N.E. of Kyoto. The tn. became an important educational centre at the Renaissance. Paper is manufactured there, and it is noted for its silk manuf. and tinned crabs. It is one of the chief tns. of the empire. An earthquake in June 1948 caused 12,000 casualties, including 1500 dead, in the prefecture. Pop. (tn.) 75,200; (prefecture) 646,700.

Fukuoka, tn. and prefecture of Japan, on the N. coas. of Kyushu, 90 m. N.N.E. of Nagasaki. The tn. became an important educational centre at the Renaissance. Paper is manufactured there, and it is noted for its silk manuf. and tinned crabs. It is one of the chief tns. of the empire. An earthquake in June 1948 caused 12,000 casualties, including 1500 dead, in the prefecture. Pop. (tn.) 75,200; (prefecture) 2,750,000.

Fukushima, tn. and prefecture, Japan, in the prov. of Iwashiro, Hondo, 168 m. from Tokyo. The tn. is an important centre for trade in raw silk and cocoons. Pop. (tn.) 18,500; (prefecture) 1,580,000.

Fukuyama: 1. Seaport of Japan, 60 m. from Hakodate, formerly the seat of the lords of Matsumae. Pop. 10,000. 2. Tn. of Japan, 110 m. S.W. of Kebe, on the S. coast of Hondo. Pop. 58,200.

Fulahs, Fellata, Fulani, Fellani, or Peulhs (plural Fulbe), important ruling Hamite-Negro race in Nigeria and Fr. Sudan, founders of the sultanates of Sokoto (q.v.) and Gando (q.v.). They are of a light brown or copper colour, of good stature, with Caucasoid features, black hair, and negroid speech. Their name undergoes many changes, as indicated above. They seem to have migrated westward at an early period, and gradually extended their influence to the E. The Fr. is divided into four great branches, viz. the Jel, the Baa, the So, and the Berl, each containing sev. tribes. They number from about six to eight millions, and towards the close of last century their sultans were a source of much trouble to legitimate Brit. trading interests. The estab. by the National African Company, between 1886 and 1896, of trading stations on the Niger and Benue brought the Brit. into contact with these vigorous Moslem emirates of the N. interior. The Fulani rulers of Kano and Sokoto and the neighbouring tns. represented a century-old wave of Moslem conquest from the Sudan superimposed upon a much older Moslem element dating from the Middle Ages.

These Fulani states were strongly administered, warlike, and ruthless in slave-raiding among the pagans and in maintaining the ascendancy of the ruling class by bloodthirsty methods. Although the company had made treaties with them there was an obvious incompatibility between the two views of what constituted desirable government, and a warlike period began in 1897. Later, in a period of difficult relations here with the Fr., at a time when the Moslem states still remained to be settled with, it was evident that a trading company was unequal to the responsibilities that would fall upon it, and in 1899 the company's (now Royal Niger Company) charter and governing powers were withdrawn and Col. F. D. Lugard (q.v.) became high commissioner for the newly constituted protectorate of N. Nigeria. His first task was to subdue the N. emirates, whose sultans would not give up slave-trading without a struggle. Already the company had had some fighting with the sultan of Sokoto, but the result was inconclusive. In 1902-3 Lugard, with inadequate forces and great exertions, overcame the Fulani rulers, and brought their ter. within the area to be ruled by their Brit. suzerain, and according to Brit. ideas of justice and humanity. See Lady Lugard, *A Tropical Dependency*, 1904, and M. Delafosse, *Haut-Sénégal-Niger*, 1912.

Fulcrum, see LEVER.

Fulda, Ludwig (1862-1939), Ger. poet and dramatist, b. at Frankfort-on-Main. His one-act verse comedy, *Die Austrichtigen*, gained him a prize in a competition in 1882, and his dramatic career may be said to have begun with his tragedy, *Christian Günther*, the same year. This was followed by a series of comedies, including *Ein Meteor* and *Die wilde Jagd*, and some dramas, amongst which are *Das verlorene Paradies* and *Die Zwillingschwester* (1901). In 1893 he won the Schiller prize with his dramatic fairy tale, *Der Talisman* (1893). F. also wrote *Jugendfreunde*; *Kaltwasser*; *Novella d'Andrea*; and a vol. of dramatic studies entitled *Aus der Werkstatt*. His trans. from the Fr. are masterly, notably those of Molière, under the title of *Meisterwerke*. His later works included *Amerikanische Eindrücke* (1906); *Der Durmkopf* (1907); *Herr und Diener* (1910); *Die Rückkehr zur Natur* (1911); and *Des Esels Schäffen* (1920). See monograph by A. Klaar, 1922.

Fulda, tn. of Hesse, Germany, and formerly cap. of Hesse-Nassau, Prussia, on rive. of the same name, 69 m. N.E. of Frankfort. A Benedictine abbey was founded here in 744, to which the tn. owes its origin. Among the most prominent buildings are the cathedral, erected early in the eighteenth century, containing the remains of St. Boniface, founder of the abbey, and the old palace of the prince-bishops. The chief industries are weaving, spinning, dyeing, tanning, enamels, etc. Pop. 17,700.

Fulgentius (Ger. monk), see GOTTSCHALK.

Fulgentius, Fabius Planciades (c. 480-550), Lat. writer and grammarian of N.

Africa, probably related to St. F. (q.v.), with whom he must not be confounded. The inflated style of his works affords strong indications of African origin. Four works, which bear evident marks of the same hand, are ascribed to him, and all represent the late African style. The *Liber Physiologus* and others are lost. The four extant works are *Mythologiarum liber iii. ad Catum Presbyterium* (the identity of Catus is unknown)—a collection of seventy-five myths connected with the hist. and exploits of gods and heroes but marred by extravagance and unsound Gk. etymology; *Expositio sermonum antiquorum cum testimonis ad Chalcidicum*—a glossary of obsolete words and phrases, but unreliable, it is often printed with or appended to the *De compendiosa doctrina* of Nonius Marcellus; *Liber de expositione Virgilianae continentalis ad Chalcidicum grammaticum*—a title which means an explanation of the *Aeneid* as a picture of human life or of the esoteric truths allegorically conveyed in Virgil's poems; and *De statibus mundi*. See M. Zink, *Der Mytholog Fulgentius*, 1867; R. Helm (editor), *Fulgentii Opera*, 1898; and H. Liebeschütz, *Fulgentius' Metamorphosis* (on his influence on medieval mythology), 1926.

Fulgentius, St. (468–533), early Christian prelate. Made bishop of Ruspi in Numidia, N. Africa, 507 or 508, but evidently against his will. As the result of a disputation with Thrasimund, king of the Vandals (496–523), an Arian who had abated somewhat of the persecution of his predecessor Genseric against the Catholic Christians, he was banished from his see (510–23), but was restored (523–32). He then retired as an ascetic to a monastery on the is. of Circe. Wrote Lat. treatises against the Arians and Pelagians (ed. by Haurer, Innsbruck, 1884). Regarded as one of the fathers of the Church. Works: *Ad Trasimundum regem Vandolorum libertas* (three books to King Thrasimund); *De Veritate predestinationis et gradie Dni* (on the truth of predestination and the grace of God); *De Fide*; *De remissione peccatorum* (on the remission of sins). See ed. by J. P. Migne, *Patrologia Latina*, vol. lxxv. Life by A. Mally, 1885. See also O. Bardenhewer, *Patrologie* (Freiburg), 1901.

Fulginia, or Fuligino, see FOLIGNO.

Fulgurites (Lat. *fulgor*, lightning), in petrology, the name given to rocks whose surface has been fused by lightning, and to the characteristic holes thus formed. Examples of the kind have been found on Ararat, in the Alps, Pyrenees, and elsewhere, the surface showing in parts a thin, glassy crust or film, like a coat of varnish. Another kind of F. (vertical sand-tubes, sometimes half an inch in diameter) is found in dry sands, as on the sand-hills of S. America and N. Africa. They often run downwards in the sand for several feet, branching off and gradually lessening in their course. The glassy material is seen under the microscope to contain grains of sand and many small cavities. Minerals like mica and felspar are fused more easily than quartz, but sometimes silica abounds in F. glasses.

Fulham, parl. bor. and suburban par. of London co., England, 2 m. from Hammersmith, 5 m. from St. Paul's, on R. Thames, just opposite Putney. Putney Bridge and Parsons Green are its nearest stations on the Metropolitan railway. F. Palace has been a residence of the bishops of London since 1141, the present building being mostly about a century old, surrounded by beautiful grounds overlooking the riv. The tombs of many bishops are in the church, and the place has memories of Bodley, Florio, Hallam, Crotch, and others. The fine market gardens are now mostly built over. F. returns one member to Parliament. Pop. 104,400.

Fulica, see COOT.

Fuller, George (1822–84), Amer. artist, noted as a portrait painter. He studied under H. K. Brown, the sculptor, in Albany (1842–43), exhibiting a portrait of him in 1857, and becoming associate of New York National Academy. He had an original, poetic style, and was a fore-runner of the idealistic school. He travelled in Europe in 1860. His best works are 'Turkey Pasture in Kentucky' (1873); 'The Romany Girl' (1879); 'And she was a Witch' (1879); and 'Winifred Dysart' (1881). See van Reusselaer, *Six Portraits*, 1889.

Fuller, John Frederick Charles (b. 1878), Brit. soldier who has gained fame in connection with the development of tanks. Major-general, 1930. Campaigns: S. African war, 1899–1902, and First World War. It was mainly through his energetic advocacy and the part he played in the use of tanks in the First World War that the weapon became a success not long after it was first used at the battle of Cambrai (q.v.). His work, *Tanks in the Great War, 1914–18* (1920) reveals the grip he had on the potentialities of this war machine. He held staff appointments continuously from 1907 until he retired in 1933. When it was decided to introduce mechanised brigades he was appointed military assistant to the chief of the imperial general staff in 1926. He has written numerous works of military science, including *British Light Infantry in the Eighteenth Century* (1925); *Sir John Moore's System of Training* (1925); *Foundations of the Science of War* (1928); *The Generalship of Ulysses Grant* (1929); *War and Western Civilisation, 1832–1932* (1932); *Empire Unity and Defence* (1934); *The Army in my Time* (1935); *Towards Armageddon* (1937); and *Armaments and History* (1946).

Fuller, Sarah Margaret (1810–50), Amer. critic and essayist, b. on May 23 at Cambridgeport, Massachusetts. She was educated by her father, a stern and unbending taskmaster, who exerted a great influence on the shrinking and sensitive nature of his child, and whose exacting helped to impair her never robust health. In 1839 she issued a trans. of the *Conversations of Goethe with Eckermann*. She became a member of the Transcendental Club, in which Emerson took a prominent part, and on the foundation of the *Dial* (q.v.), the literary organ of the club, she accepted the editorship, with George Ripley as

assistant editor. This was in July 1840, and for two years Margaret F. struggled to keep the paper alive in the face of financial stress. In 1844 she pub. her first vol., *Summer on the Lakes*, and in 1845 *Woman in the Nineteenth Century*. In the same year she joined the staff of the New York *Tribune* as literary critic, under Horace Greeley, and in 1846 her contributions to the paper were reprinted as *Papers on Literature and Art*. In the next year she went to reside in Italy, and in Rome she met her husband, Giovanni Angelo, Marquis Ossoli, an adherent of Mazzini. During the siege of Rome in 1849 by the Fr., who took charge of a hospital; but after the capitulation of the city and the total loss of her husband's property she decided to return to America. Setting sail with her husband and her infant child on May 17, 1850, she made a successful voyage until nearly arrived at New York. Then on July 16 the vessel was wrecked on Fire Is. Beach, and she and her husband and child were drowned. Thus perished a woman remarkable for her culture, her courage, and greatness of intellect. Her *Autobiography*, with memoirs by Emerson, Channing, and Clark was pub. posthumously in 1852, and several lives have been written, notably those of Julia W. Howe, 1883; T. W. Higginson in 1884; and K. Anthony in 1922.

Fuller, Thomas (1604-61), Eng. author and divine, b. at Aldwinkle in Northamptonshire, his father being rector of the par.



THOMAS FULLER

He went to Queens' College, Cambridge, where he graduated in 1628, and two years later was appointed to the curacy of St. Benet's. He became rector of Broadwindsor, Dorsetshire, in 1634, but gave up his living in 1641, and settled in London, taking a curacy at the Savoy church in the Strand. His *History of the Holy War* had appeared in 1639, and on coming to London he pub. the *Holy and Profane State* (1642), his most characteristic work. He was a chaplain in the

royal army during the Civil war, and a strong adherent of the royal cause; and during this time wrote, for the encouragement of his men, *Good Thoughts in Hard Times* (1645) and a sequel, *Good Thoughts in Worse Times* (1647). In 1648 he was appointed to the living of Waltham in Essex, and ten years later received the living of Cranford in Middlesex. At the Restoration he was appointed chaplain extraordinary to the king. One of F.'s characteristics is his quaint humour, though his wit is never forced, and, like Hood, he plays upon words instinctively. His writings are remarkable for wisdom and imagination, as well as pathos, when occasion demands. Amongst his numerous works, besides those already referred to, may be mentioned *A Pisgah Sight of Palestine and the Confines Thereof* (1650), with maps and views, a geographical account of the Holy Land; *The Church History of Britain from the Birth of Christ until the Year 1648* (1655); *Mix'd Contemplations in Better Times* (1660); and *The Worthies of England* (pub. posthumously, 1662), etc. See S. T. Coleridge, *Literary Remains*, 1836; E. K. Broadus (ed.), *Thomas Fuller: Selections, with Essays by Charles Lamb, Leslie Stephen, etc.*, 1929. Lives by A. T. Russell, 1844; J. E. Bailey, 1874; M. Fuller, 1884; E. N. S. Thompson, *Literary Hypothas of the Renaissance*, 1924; and D. B. Lyman, 1935.

Fuller's Earth (A.-S. *fullere*, from Lat. *fullus*, fuller), pulverulent material resembling clay in appearance, fine-grained, and of a variable colour without plasticity, formerly much used for fulling cloth and wool, that is, cleansing these materials of oil and grease, from whence it derives its name. Nowadays it is more generally employed for clarifying cottonseed and lubricating oil, as a filtering material, absorbing their impurities. F. E. was at one time only mined in England, chiefly at Nutfield, near Reigate, Surrey, and also at Woburn and near Bath, and was considered of great value, its exportation being prohibited. Recently, however, deposits have been discovered in various localities in the U.S.A., chiefly in Florida. See *Mineral Resources of the United States*, issued by the U.S.A. Geological Survey (Washington, annually). Cimolite, a variety of F. E., is found in the is. of Argentiera, Greece, and has been mined from ancient times.

Fullerton, Lady Georgiana (Leveson Gower) (1812-85), Eng. philanthropist and novelist; daughter of the first earl of Granville. Her earlier works include *Ellen Middleton* (1844) and *Granley Manor* (1847). In 1846 she entered the Rom. Catholic Church and later wrote controversial novels on Catholic subjects, including *Lady Bird* (1852); and *Constance Sherwood* (1865). See Lives by A. Craven (trans. from the Fr. by H. J. Coleridge), 1888; C. M. Yonge, 1897; and M. Oliphant, *Victorian Novelists*, 1892; F. M. Taylor, *The Inner Life of Lady Georgiana Fullerton, with Notes of Retreat and Diary*, 1899.

Fulleylove, John (1847-1908), Eng. oil and water-colour painter, especially of landscapes. He was early articled to a

firm of architects, and exhibited from 1871 at R.A., R.I., and R.B.A. His pictures show great feeling for colour and atmosphere, together with excellent drawing. He produced two series of drawings of the Oxford and Cambridge colleges and churches. F. became a member of the Royal Institute of Painters, 1879.

Fulmar, see PETREL.

Fulminates, class of salts derived from fulminic acid, C:N-OH; they are isomeric with cyanates, but explode violently when struck or heated. The two chief are fulminating mercury and silver. The first is obtained by heating mercury with alcohol and nitric acid. The white, silky crystals are used in manufacturing percussion caps. Brugnatelli's fulminating silver was first obtained in 1798, a year before Howard's mercury, which merely substituted mercury for silver in the heating process. The white needles are bitter and poisonous. Fulminates of several other metals are known. See J. F. Thorpe, *Dictionary of Applied Chemistry*, 1922.

Fulminic Acid (C:N-OH), an organic acid isomeric with cyanic acid. Its salts or 'fulminates' are very explosive and used as detonators. The free acid is also very explosive, and the vapour poisonous like that of prussic acid. It and its salts are interesting inasmuch as they contain a bivalent carbon atom, the normal valency of element being four.

Fulton, Robert (1765-1815), Amer. mechanician and engineer of Irish parentage. From 1786 he studied under West in England, taking out patents for several inventions. F. was in Paris, 1797-1804, and devoted considerable attention to steam navigation. By 1803 he had constructed a small steamboat which navigated the Seine. His inventions included flax-spinning and dredging machines, and a submarine or torpedo (Nautilus, 1801). Disappointed by his reception in France and England, F. returned to America, and was employed by the gov. in making canals. In 1807, with Livingston, he perfected the discovery of steam navigation, and launched the *Clermont*, which went from New York to Albany (150 m.) in 32 hrs. Speed was soon considerably increased. F. pub. *Treatise on the Improvement of Canal Navigation* (1796) and *Torpedo War* (1810). See lives by C. D. Colden, 1817, and C. Montgry, 1825; and T. W. Knox, *Fulton and Steam Navigation*, 1893; Mrs. A. C. Sutcliffe, *R. Fulton and the 'Clermont'*, 1909; H. H. Thurston, *History of the Growth of the Steam-engine*, 1878; and H. W. Dickinson, *R. Fulton: Engineer and Artist*, 1913.

Fulton: 1. City of Oswego co., New York, U.S.A., on the Oswego Canal, 24 m. from Syracuse. It is on the New York, Ontario, and W. and other railways. It has flour, pulp, paper, and woollen mills. Pop. 13,300. 2. Cap. of Callaway co., Missouri, U.S.A., 26 m. from Jefferson city. It has a state asylum for the insane, a deaf and dumb institute, the Presbyterian Westminster College, and the Synodical Female College. The fireclay manufs. are important, and there

are coal-mines and mineral springs near. Pop. 8200.

Fulvia (d. 40 B.C.), Rom. lady noted for intrigue and ambition. Her first husband was Clodius, killed by Milo; her third, Mark Antony (44 B.C.). She had considerable power in Rome during the civil war that followed Caesar's murder, and showed a vindictive spirit over the proscriptions. She instigated an unsuccessful revolt against Octavius, her son-in-law, during his absence in the E. Besieged in Perusia, she managed to escape to Athens, but was coldly received by Antony, and d. soon afterwards at Sicyon. See Cicero, *Philippics*, ii.

Fum, Funs-hwang, or Fung-hwang, in Chinese mythology, a fabulous bird of good omen, one of the four symbolical creatures supposed to guard the celestial empire. Its appearance heralds an age of universal virtue and prosperity. Sometimes called the Chinese phoenix it is a grotesque mixture of many birds and beasts, with a fish's tail. It perches only on the woo-tung tree, and frequently figures on porcelains or the embroidered robes of mandarins.

Fumage, see HEARTH-MONEY.

Fumaric Acid, acid geometrically isomeric with maleic acid, and possessing the formula HOOC-CH=CH-COOH. It occurs in various fungi, in the fumitory (*Fumaria officinalis*), and in Iceland moss. It may be prepared by heating maleic acid alone to 150° C., or by heating it with hydrochloric acid or hydrobromic acid, and by boiling monobromosuccinic acid with water (HOOC-CHBr-CH₂-COOH = HOOC-CH : CH-COOH + HBr). F. A. is a white crystalline solid, which when heated yields maleic anhydride and water. See also MALEIC ACID.

Fumay, tn. of Ardennes dept., France, on R. Meuse, 16 m. from Mézières. It has slate quarries, breweries, and engineering works. F. stands among wooded heights, two being known as Dames de la Meuse. Pop. 4900.

Fumbina, see ADI'MAWA.

Fume Precipitation, Electrical. This method, known also as electrostatic precipitation, is associated with the names of Lodge and Cottrell. Although attempts to precipitate smoke electrically were described by the Ger. Hohlfeld in 1824, the first attempts at industrial application coincided with the work of Lodge (1884), and the first successful installation was in America in connection with the removal of sulphuric acid mist from smelter gases. The principle of electrostatic deposition consists in passing the gas to be treated through an intense electric field between a central electrode at high potential and the walls of earthed plates or tubes. The tubes, which may be of various materials depending on the nature of the gasses treated, are frequently arranged in batteries or groups; the distance between the electrodes varies from 2 to 6 in., while the voltage may be between 30,000 and 100,000, and is regulated to give as strong a glow discharge as possible without disruptive or spark discharge. On passing through such an apparatus the particles

of dust, mist, or fume become charged, and are immediately attracted to and deposited on the larger electrode surfaces of opposite polarity. If liquid, the particles coalesce and flow away; if solid, a tapping device is provided to dislodge the dust which collects at the base of the apparatus. The high-tension direct current necessary for charging the central electrode is obtained from a rectifier supplied from a step-up transformer. There are three chief types of rectifier: (1) the thermionic valve, (2) the mechanical or commutator type, (3) the Westinghouse metal (copper oxide) rectifier. The valve is fragile and has a life of about only 1500 hrs.' continuous working; the commutator-rectifier produces sparks and may cause interference with radio reception in surrounding dists. The metal rectifier represents the most recent development in the rectification of high tension voltages and is embodied in the Simon-Carves system. Electrostatic precipitation removes sulphur trioxide from gases by the formation and precipitation of sulphuric acid mist, so that moisture content and temp. are important considerations. According to Howard (*Trans. A.I.M.E.*, 49, p. 540) for the removal of sulphur trioxide and dust from copper furnace fumes, a gas vol. of less than 15 ft. per sec., a temp. of about 90° C. and a water content equal to about 4 per cent by weight of the dust collected, give the best results. The process has also been applied successfully to the electrostatic precipitation of various metallic and acid fumes, to the dust from cement kilns and, more recently, to the treatment of smoke and dust from power plants and the removal of tar from carbonisation gases. The efficiency of removal is generally over 99 per cent.

Fumigation (from Lat. *fumigare*, to smoko), operation of burning, or volatilising substances in order to produce vapours calculated to destroy disease germs, vermin, etc. The use of F. as a disinfecting process is now practically restricted to steam and hot-air disinfection. Other measures, such as the burning of resins, camphor, etc., have little or no effect on micro-organisms, and preserve their popularity by virtue of the powerful odours which effectively disguise any smell of putrefaction. F. for the destruction of vermin is effectively carried out in the case of house vermin by burning sulphur. The paper should be stripped from the walls, the room made as airtight as possible before the sulphur is lighted, and the fumes should then be left for some time to penetrate into every corner and crevice. A favourite manner of ridding the garden of insect pests was to fumigate with tobacco smoke. This was done by enclosing some strong tobacco mixed with organic refuse in a wire cage, getting it well alight by swinging the cage in the air, and then leaving it to smoulder in close proximity to the plants to be treated. In medicine F. means the treatment of the skin with the vapours of drugs; calomel is often absorbed in this way.

Fumitory, popular name given to species of *Fumaria*, a genus of herbaceous plants.



Funchal (Portuguese, place of fennel), cap. of Madeira, on the S. side of the is. The tn. is well built and picturesque, containing a cathedral, opera-house, and a museum. Its streets are narrow, and in the place of wheeled vehicles, sleds are used, drawn by oxen. The harbour of F. is the only port in Madeira for ocean-going steamers. It exports fruits, wine, embroidery, etc. F. has come into prominence as a health resort on account of its mild climate and is largely visited in the winter by convalescents. Magnificent scenery is presented by the neighbouring mts. Pop. 54,800.

Function, in mathematics a number whose value is dependent on the value of another number or other numbers. Any symbol which may take on one of a class of values, and is not restricted to a single value, is called a variable. A casual labourer's yearly income, which may fluctuate within certain fairly definite limits, is, therefore, a variable quantity. If it fluctuates simply because he cannot work on wet days, its value depends on the number of wet days in the year; the labourer's income may then be said to be a F. of the number of wet days in the year. If it depends on other causes also, such as the general prosperity of the dist., his personal health, etc., it may be stated as a F. of many variables. In algebraical language, the variable y is called a F. of the variable x if to every value of x there corresponds one or more values of y . Such quantities as ax , $ax+b$, x^2 , $\sin x$, $\log x$, etc., are all Fs. of x . When a quantity involves the first power of x only, as in $ax+b$, it is said to be a linear F., or F. of the first degree; when it involves the second power of x and no higher power, as in ax^2+bx+c , it is said to be a quadratic F., or F. of the second degree; when it involves the third power of x and no higher power, as in ax^3+bx^2+cx+d , it is said to be a cubic F., or F. of the third degree; in general, a F. of the

form $a_n x^n + a_{n-1} x^{n-1} + a_{n-2} x^{n-2} + \dots + a_1 x + a_0$ is said to be a F. of the n th degree. F.s. are indicated by the signs f, F, ϕ ; thus, if y is a function of x , the relation is shown by the equation $y = f(x)$. Where there are two or more variables, the relation is indicated as in $y = f(x, r)$ and $y = f(x, r, s)$. The variable on which the value depends is called the independent variable, that whose value depends on the independent variable is called the dependent variable; thus in the relation $y = f(x)$, x is the independent, and y the dependent, variable. A F. is said to be homogeneous when all its terms are of the same degree. A rational and integral F. is one where the indices of the variables are positive integers and the coefficients do not involve the variable, as in the form $a_n x^n + a_{n-1} x^{n-1} + a_{n-2} x^{n-2} + \dots + a_1 x + a_0$.

A symmetrical function is one in which any two variables may be interchanged without altering the value of the F. Thus $x^3 + y^3 + z^3 - xyz$ is a symmetrical F. An alternating function is one where, if two variables are interchanged, the F. is altered in sign but not in value. Thus $a^3(b-c) + b^3(c-a) + c^3(a-b)$ is an alternating F.

Derived functions may be obtained in this way. Let $f(x) = a_0 x^n + a_1 x^{n-1} + a_2 x^{n-2} + \dots + a_{n-1} x + a_0$. Then $f(x+h) = a_0(x+h)^n + a_1(x+h)^{n-1} + \dots + a_{n-1}(x+h) + a_n$. Expanding, we get $a_0 x^n + a_1 x^{n-1} + \dots + a_{n-1} x + a_n + h[n a_0 x^{n-1} + (n-1)a_1 x^{n-2} + \dots + (a_{n-1})] + \frac{h^2}{2}[n(n-1)a_0 x^{n-3} + (n-1)(n-2)a_1 x^{n-4} + \dots + 2a_0]$. This result is written more concisely as $f(x+h) = f(x) + h f'(x) + \frac{h^2}{2} f''(x) + \dots + \frac{h^n}{n!} f^{(n)}(x)$ and the numbers $f'(x), f''(x), \dots, f^{(n)}(x)$ are known as the first, second, ..., n th derived F.s. of $f(x)$.

Limiting values.—In the equation $y = f(x)$, if, as the independent variable approaches a value a , the F. $f(x)$ can be made to differ by as little as we please from a fixed quantity b , then b is called the limit of y , when $x = a$. Consider the series $1 + \frac{1}{2} + \frac{1}{3} + \dots$. The sum $= 2 - \frac{1}{2^{n-1}}$ and is therefore a F. of n ; that is, $S = f(n)$. But $\frac{1}{2^{n-1}}$ can be made as small as we please by increasing the value of n ; that is, the value of S can be made to differ from 2 by as little as we please. This is expressed by saying that the limit of S is 2 when n is infinite.

F.s. may be either algebraical or transcendental. An algebraical F. is one which may be expressed in a finite number of terms, and involves no other processes than those of addition, subtraction, multiplication, division, and root-extraction. All other F.s. are called transcendental, and include such F.s. as $\log x$, $\sin x$, $\cos x$, etc.

A F. is said to be continuous when an infinitely small change in the independent variable is accompanied by a correspond-

ingly small change in the dependent variable. A F. is said to be discontinuous when an infinitely small change in the independent variable is accompanied by a great change in the dependent variable.

Periodic functions are those whose values recur regularly to certain limits, passing through all the values between those limits, while the independent variable increases or decreases in value by a certain definite amount called the period. To quote an example from trigonometry, $\sin A$ is a F. of A ; as A increases from 0° to 90° , $\sin A$ increases from 0 to 1; as A increases from 90° to 180° , $\sin A$ decreases from 1 to 0; as A increases from 180° to 270° , $\sin A$ decreases from 0 to -1; as A increases from 270° to 360° , $\sin A$ increases from -1 to 0; as A increases from 360° to 450° , $\sin A$ increases from 0 to 1, and so on. It is now seen that the limits of the values of the F. $\sin A$ are -1 and 1, and that the values fluctuate between these limits as the angle increases. The value of $\sin A$ is 1 when $A = 90^\circ$ or 450° or 810° ... The period in this case is therefore 360° , and any values of the independent variable which have a difference of 360° give the same value for the dependent variable. This is expressed by stating that $f(x+ka) = f(x-ka)$ for all values of x , a being the period. The importance of periodic functions is best demonstrated by their use in connection with the theory of sound vibrations. Any periodic disturbance in air may be resolved into a series of sine curves. Fourier's theorem states that a single-valued periodic F. may be expressed as a convergent series, thus:

$$\frac{1}{2}A_0 + \sum A_n \cos \frac{2\pi n x}{a} + \sum B_n \sin \frac{2\pi n x}{a} + \dots$$

where a is the period and n has values from 1 to infinity.

Elliptic functions are usually defined with reference to elliptic integrals, so-called because certain types are expressed by the arc of an ellipse. The development of these F.s. is owing in a great degree to the labours of A. M. Legendre (1752-1832), who pub. his *Traité des fonctions elliptiques* in 1827. His work was supplemented and to an extent revolutionised by N. H. Abel and C. G. Jacobi. A good introductory treatise is provided by A. C. Dixon in his *The Elementary Properties of the Elliptic Functions*, 1891. See also J. Wright, *Theory of the Functions of Complex Variables*, 1918; E. Hobson, *Theory of Spherical and Ellipsoidal Harmonics*, 1931; and E. C. Titchmarsh, *Theory of Functions*, 1932.

Function, physiology, the special activity of a cell, tissue, or organ. In organisms which comprise but a single cell, all the various types of activity necessary for the maintenance of the living state are undertaken by the cell as a whole; the amoeba, for example, performs the processes of engulfing its food, digesting it, excreting waste material, and building up the nutrient matter into its

own substance by chemical and physical actions in which all parts of the cell seem to join. Multicellular organisms, on the other hand, possess cells which are differentiated for special activities, and their form is determined by the work they are called upon to do. Again, certain cells take on a measure of continuity with each other to form tissues which are again differentiated according to the work they have to perform. Thus we have connective tissues, including the varieties: osseous tissue, cartilaginous tissue, fibrous tissue, adipose tissue, nervous tissue, epithelial tissue, etc. These tissues enter into the structure of organs with special activities; thus we say the F. of the stomach is to digest, that of the kidney to excrete waste liquid products, and so on.

Functionalism, see under ARCHITECTURE, Modern Architecture.

Fundamental Base, music, is the note on which a chord is built—the root, ground note, or generator. Thus in the chord CEG, C is the F. B. in whatever position the chord is written.

Fundamentalism is in its essence the opposition of orthodox churchmen to the teaching of modern science where the latter comes into conflict with the Bible story. F. came into nation-wide notice in the U.S.A. in 1925, wth a young school teacher, John T. Scopes, was arraigned in court on the charge of violating the Tennessee state laws which forbade the teaching of evolution in the state public schools. Scopes was a teacher in the high school in Dayton, Tennessee. Wm. Jennings Bryan, who had thrice run for the presidency of the U.S.A., came to Dayton to take part in the prosecution of the case. The immediate issue was a violation of a state law. But in its wider implications the case involved the serious question whether a state, through its legislature, could restrict scientific teaching when it conflicted with religious beliefs. The irreverent Amer. journalists labelled the case 'the monkey trial.' Bryan solemnly argued for the literal truth of every word and every sentence of the Bible. He objected to the theory of evolution, because it ran counter to the Bible story of creation. The jury promptly brought in a verdict against Scopes and he was fined 100 dollars. Later the highest court of the state reversed the decision, doing so on a purely technical point of law. Mississippi afterwards passed a similar law, and the Fundamentalists attempted to bring this about in some seven or eight other states, but their measures were killed by ridicule. See H. E. Fosdick, *The Modern Use of the Bible* (against F.), 1924; J. C. Machen, *What is Faith?* (for F.), 1925; M. Shipley, *The War on Modern Science*, 1927; and S. G. Cole, *History of Fundamentalism*, 1931.

Funded Debt was the term originally used for a debt the service (administration and payment of interest) of which was secured upon some specified fund. But the term is now used without special application to any fund in respect of any large public loan raised for permanent purposes, bearing a certain rate of interest. When

the loan is raised a date of repayment may or may not be quoted. The F. D. of the United Kingdom belongs to the latter category, but the gov. reserves to itself the right to redeem after a fixed period. Goschon's consols, a case in point, were made redeemable after 1923. The practice in general use in the United Kingdom for the reduction of debt is that of a sinking fund from which contributions should be made annually by the chancellor of the exchequer. This practice is open to the objection that in the hands of a chancellor who is not too squeamish the sinking fund is open to inroads which may help him to tide over his difficulties for the time, but unfortunately do not help in the reduction of the national debt. Another practice adopted is that of conversion, by which means loans issued at certain rates of interest are converted into issues bearing a lower rate. Nations other than Great Britain in reduction of their F. Ds. usually adopt the practice of yearly purchase by drawings, the money for this purpose being supplied by a sinking fund. See also under PUBLIC DEBT.

Fundi, see FONDI.

Funds, see PUBLIC DEBT.

Fundy, Bay of (Fr. *baie de la baie*, head of the bay), arm of the Atlantic Ocean separating Nova Scotia from New Brunswick and the state of Maine, extending 180 m. in length. It is exceedingly difficult of navigation, owing to the tides, which at certain seasons have a rise and fall of 53 ft., producing dangerous bores in the upper reaches. At low tide the shores have the appearance of long stretches of mud-flats.

Fünen (Dan. *Fyn*) is (with the exception of Zealand) the largest is. of Denmark, situated between the Kattegat, the Little Belt, and the Great Belt. It is 50 m. long by 40 m. wide, and is fertile and well wooded. Flax, fruit, grain, and hemp are cultivated. Bee-keeping and cattle and horse rearing are carried on and form the prin. export. The fisheries are also important. Chief tns.: Odense (the cap.), Svenborg and Nyborg; area 11,000 sq. m.; pop. about 300,000.

Funeral Orations, formal and elaborate eulogies given by the anct. Gks. and Romans, on some great person recently passed away. F. O. combined the strongest points of demonstrative oratory and employed the highest type of eloquence. They were finished and elegant in style, and the encomium was specific—the finished life and its closed events being held up as an inspiration to the living for future guidance.

Funeral Rites, observances connected with death and burial. The care of the dead is a marked feature of religion among all nations and all classes, being associated with spirit, belief, and custom. Among the Hindus the corpse is perfumed and adorned with flowers and then buried. The Muslims bury their dead; and, as is well known, the Egyptians always embalmed dead bodies (see MUMMIES). The mourning customs of the Jews may be collected from the Scriptures. In the religious creed of the Gks. and Romans,

sepulture of the dead was an act of piety to prevent the wanderings of the spirit on the shores of Styx. They burned their dead on funeral pyres and deposited the ashes in an urn. Funeral expenses in law are a privileged debt allowed before all other charges, both in England and Scotland, if limited to the estate left by deceased. See BURIAL, CUSTOMS, AND LAWS OF.

Funeral Shows or Games, practice restricted chiefly to the Gks. and Romans of antiquity. In the heroic ages games were celebrated at the funeral of a great man (as of Patroclus, see *Iliad*, xxiii.). Scenic exhibitions or more frequently combats of gladiators (Bustuarii) took place among the Romans. See Servius, *ad Verg. Aen.* x. 519; Horace, *Sat.*, II. 3; Livy, xxxiv. 46; Dion Cassius, xxxvii. 51; and Cicero, *Pro Sull.*, xix.

Funeral Societies, see under FRIENDLY SOCIETIES.

Fünfkirchen, see Pécs.

Fungi, one of two classes of plants belonging to the Thallophyta, the group which includes the most lowly organised plants. F. are distinguished from the algae, the other class, by the absence of green colouring matter, or chlorophyll; hence they cannot assimilate carbon dioxide, but are dependent for food on organic substances. They are all either parasites, when they live on living plants or animals, or saprophytes, when they depend on dead organic matter for their food substances. Nearly all diseases of plants are due to the ravages of F. (apart from those caused by insects), and the class includes forms which vary from a single cell, only visible under a microscope, to more highly specialised forms with conspicuous fructifications. The vegetative part, or mycelium, of the higher F., consists of a mass of intertwined threads, or hyphae; in the common mushroom (*Agaricus campestris*) this constitutes what is known as spawn. The fructification is made up of the same sort of hyphae, which are more closely packed together to form the stalk, on the apex of which is the umbrella-like cap; the spores are formed in the pink gills on the under-surface of the cap. All forms produce asexual spores, and in some members there is also a sexual process. There are six main divs. of F.: (1) Schizomycetes (Gk., *division F.*, from their mode of reproduction), which includes all the bacteria, though many authorities consider that the bacteria should form a separate kingdom of living organisms, neither plant nor animal. (2) Myxomycetes, or slime F.; in these the body is a plasmodium, a creeping gelatinous mass. This group is often claimed under the title Mycetozoa by the zoologists. (3) Phycomycetes. To this div. belong many moulds, the potato disease, 'damping off' disease, and many others. (4) Ascomycetes. This includes a great many forms, some unicellular, others of complicated structure, but all have an ascus, which is a swelling cut off at the end of a hypha, and in it eight spores are formed. Mildew of roses, blue-green mould on jam, etc., the ergot

of rye, yeast, witches' brooms on silver birch-trees, and the green mould *Penicillium* from which penicillin is obtained, are all members of this subclass; some of the higher forms have cup-shaped fructifications which are brightly coloured, e.g. *Peziza*. (5) Acidimycetes. The members of this group present a remarkably complex life hist., and among them are the rusts and smuts. *Puccinia graminis* may be cited as an example; at one stage of its existence it forms conspicuous rusty red streaks down the stems and leaves of wheat, rye, etc.; in this stage orange red spores are formed, which on germination attack the wheat again. Later in the season the mildew appears, which is another stage of the same fungus, when it



FUNGI (BASIDIOMYCETES)

A, Ink cap or Shaggy cap (*Coprinus comatus*)
Left to right, puff-ball (*Lycoperdon sacculatum*);
edible mushroom (*Agaricus campestris*), morel
(*Morchella esculenta*); *Agaricus* (*Pleurotus*)
ostreatus.

is producing a different and darker kind of spore (the teliospore), which can rest through the winter. On germination it gives rise to a few hyphae which produce yet another kind of spore, which will only germinate on a totally different host, the common barberry. The disease on this plant takes the form of swollen discoloured patches on its leaves. (6) Basidiomycetes. These are the mostly highly organised of the F., and include mushrooms, toadstools, and puff-balls. The characteristic spores are the basidiospores, formed in fours on a basidium. Group (5) above, the Acidimycetes, are often included with the Basidiomycetes. The lichens each consist of a fungus and an alga living in partnership (*symbiosis*). In addition to the above six groups there are also the Actinomycetes (allied to bacteria) and the *Fungi imperfecti*. See G. Massee, *British Fungi*, with a Chapter on Lichens, 1911; J. W. Harshberger, *Text Book of Fungi*, 1917; M. Grieve, *Fungi as Food and in Medicine*, 1925; H. Gwynne-Vaughan and H. Barnes, *Structure and Development of Fungi*, 1927; A. H. Buller,

Researches in Fungi, 1931; and A. Parker-Rhodes, *Fungi, Friends or Foes?*, 1948.

Fungus, in pathology, a term applied to a variety of morbid excrencences of the appearance of fungi. F. of the brain is really a hernia, the brain protruding through the skull. F. of the *dura mater*, or outermost membrane of the brain and spinal cord, consists of a tumour which perforates the skull. F. arthritis is a name given to tubercular disease of the joints, accompanied with the formation of a white spongy mass. Some members of the F. order of plants are parasitic to man, causing diseased conditions; such are *Achorion schleiniti*, causing *furax*, *Microspor ondouini*, and *Trichophyton tonsurans*, causing ringworm, and *Actinomyces bovis*, or ray F., which causes the swelling of the jaw, known as actinomycosis (q.v.).

Fungus Melittensis, see CYNOMORIUM.

Funicular Machine, name applied by some mechanicians to a cord or chain attached at one end to a fixed point, the other end passing over a fixed pulley or friction wheel and having a weight suspended from it; a weight is also hung from the cord or chain in some part of its length, between the fixed end and the pulley. Thus the cord becomes a mechanical agent, for unequal weights applied, as has been said, may be in equilibrium. When a cord is suspended in a vertical plane between two fixed points and acted on by weights at different places, it is called a F. polygon; if the form of the suspended cord is given, and the weight to be applied at one angular point, the weights at all the other angular points in the case of equilibrium can be found.

Funicular Railway, see RAILWAYS, Mountain Railways.

Funk, Isaac Kaufman (1839-1912), Amer. author and publisher, b. at Clifton, Ohio, and educated at Wittenberg College and at Wittenberg Theological Seminary. He was ordained a minister of the Lutheran Church (1861), and after holding various pastorates, he started a publishing business (1876), in which he was joined by A. W. Wagnalls (1878), the firm being known since 1890 as Funk and Wagnalls Company. He ed. the *Standard Dictionary*, founded the *Metropolitan Pulpit*, now the *Homiletic Review*, 1876, and various other papers, and wrote, among other works, *The Next Step in Evolution* (1902) and *The Psychic Riddle* (1907).

Funk, Walther (b. 1890), (Ger. journalist and economist, educated at Berlin and Leipzig Univs. Appointed head of the Reich press bureau in 1933; in the same year made Reich minister of propaganda. Minister of economics, 1938, and in 1939 he took over the Reichsbank when Dr. Schacht (q.v.) was dismissed in Jan. of that year. He was president of the Reichsbank until 1945. His pubs., mostly on economics, include *Deutsche Wirtschaftsnot* (1926); *Deutsche Wirtschaftspolitik im Osten* (1927); *Internationale Kapital-verflechtungen und -aufgaben des neuzeitlichen Kapitalismus* (1928). Tried at Nuremberg as a war

criminal, and found guilty of planning aggressive war, war crimes, and crimes against humanity and sentenced to life imprisonment.

Funkia (from Funk, a Ger. botanist), a genus of Liliaceæ, occurs wild in China and Japan, but the five species are all hardy plants and will grow in Britain. The flowers are very showy and are often called plantain-lilies.

Funny-bone, popular name for that part of the elbow where the ulnar nerve passes down the inner condyle of the humerus. The nerve being comparatively unprotected, a blow on this point will cause a tingling, prickling sensation down the whole length of the nerve to the ulnar side of the hand, followed by numbness. It has also been termed the crazy-bone.

Fur, see FURS.

Fur, matter formed inside vessels through the lime in water, or similar constituents, used also of deposits left by damp. More frequently used as a verb, as, a kettle has become 'furred.' In this way it is also applied medically to a 'furred' tongue, one that has become coated with matter.

Furetière, Antoine (1619-88), Fr. lawyer and lexicographer, b. in Paris. His announcement that he had compiled a dictionary of the Fr. language brought about his expulsion from the Fr. academy for alleged plagiarism, that body fearing that his dictionary was intended to supersede their own. F.'s dictionary was pub. two years after his death, and it is a valuable work. An improved ed. was pub. by B. de Berval in 1701, and the last reprint was at Amsterdam in 1725. It has survived as the basis of what is called the Dictionnaire de Trevoux. His other works were *Five Satires* (verse); *Gospel Parables* (verse); *Le Roman bourgeois*; and especially *Fureteriana* (pub. posthumously), being a collection of *bons mots* or anecdotes, which have often been or parodied.

Furfuran, or Furan (C_4H_6O), organic substance obtained by heating the barium salt of pyromuonic acid with soda-lime. It is a colourless liquid boiling at 32° C., is insoluble in water, and has the characteristic smell of pine-wood tar, in which it occurs. A molecule of furan may be looked upon as possessing closed chains of five atoms; if the oxygen atom be replaced by sulphur, thiophene is produced; if it be replaced by NH, pyrrole is produced. Furfural, *furfurol*, or *furfuraldehyde* (C_4H_4OCHO) is the aldehyde of pyromuonic acid, and may be prepared by distilling bran with dilute sulphuric acid. It is a colourless liquid boiling at 162° C., and is soluble to some extent in water. It has a pleasant smell, and turns brown on exposure to the air. When mixed with caustic potash, furfural-alcohol and pyromuonic acid are formed, and it shows general properties analogous to those of benzaldehyde. With phenol (q.v.) furfural forms resins which are widely used in the manuf. of moulded articles similar to those made from cellulose, galalith, etc. Furfural and various of its derivatives are employed as solvents, germicides, etc.

See Chicago Mines Laboratories Bulletin, No. 2 (1925), *Furfural and its Derivatives*.
Furfuratorum, *see* CRUSCA, ACCADEMIA DELLA.

Furies, or Furiae, *see* EUMENIDES.

Furka Pass, one of the highest Alpine passes in Switzerland (7992 ft.). It leads from Andermatt, in the canton of Uri, to the Rhone glacier, passing through the Reuss valley and ending at the Hôtel Gletsch in Valais.

Furlong, measure of length amounting to one-eighth of a statute mile. The original term was 'furrow-long,' and was the measurement of a furrow in the 'common field' system, and in consequence varied according to the dists., but the side of a square containing 10 ac. was the generally accepted length, 40 poles. In the ninth century the word F. was used to translate the Lat. *stadium*, which was one-eighth of a Rom. mile.

Furlo Pass, tunnel, some 40 yds. long, excavated in the Apennines, Italy. It is part of the Via Flaminia, the old Rom. road from Rome to Fano on the Adriatic. An inscription at the N. end records that the tunnel was made by the Emperor Vespasian, A.D. 77.

Furlough, military term used for leave of absence. On home service it applies to non-commissioned officers and men, but on foreign service it is also applied to officers. When on F. a soldier may not leave the United Kingdom, and is in receipt of full pay.

Furnaces (Lat. *fornax*, a vault), contrivances for producing useful application of heat generated by the combustion of fuel. The number of different varieties and uses of F. is very great, but there are in the great majority of cases three essential parts. The fire-place is the portion of the furnace where the combustion of the fuel takes place; the place where the heat is applied to the special work of the furnace is known by various names, such as the chamber, laboratory, hearth, working-bed, etc.; and in addition there is the chimney, or some apparatus for supplying air under pressure to the fire. The class of fuel used and the intensity of the heat required are factors in determining the different modifications of F. In all cases the combination of economy and efficiency is desired; combustion should be regular, and the air and fuel mixed in correct proportions. F. may be classified into two main types, in the first of which the effect of combustion is simply the heating of the material to which the heat is applied. In the second a chemical change also occurs as a result of heating. F. for steam and for heating buildings are examples of the first type, whilst most metallurgical F. belong to the second type. The second class of F. may be subdivided as follows: (1) Where the fuel and the substance to be heated are in contact with each other: to this class belong shaft, blast, and hearth F. (2) Where the substance is heated directly by the products of combustion: these are reverberatory F. When the charge is not melted the furnace is known as a 'wasting' or 'calcining' furnace; when it is, as a

'melting furnace.' (3) Where the substance is not directly heated by the fuel or the products of combustion. When the heating chamber is fixed and forms part of the furnace, the latter is known as a muffle furnace. Other varieties are crucible F. and retort F. There are four main objects to be studied; the greatest quantity of heat must be ensured, the dissipation of heat must be prevented, the heat must be concentrated and directed to the substance to be acted on, and it must be under the control of the operator.

In the F. of the first class, for heating boilers, a grate of fire-bars with short spaces between forms the receptacle for the fuel, and part of the air for combustion is drawn between these bars. As the fuel burns it is converted into gases, which burn above and in contact with the boiler. In addition to the air which comes through the fuel, a considerable quantity is admitted into the space between it and the boiler. The supply of air thus admitted is regulated by such contrivances as dampers; if too much is admitted heat escapes up the chimney, whilst if too little the combustion is retarded and unburnt fuel is wasted, and in both cases smoke is caused. Where possible a tall chimney provides the draught required, the sharpness of the draught varying as the height of the chimney. In ships and locomotive steam engines a chimney cannot always be erected, and draught is then produced by fans, or by the action of a jet of exhaust steam. Blast F. are of very great antiquity, and forms differing little from ordinary smith's F. are now used in India. The Catalan and Walloon forges, formerly used in the production of malleable iron, mark stages in the development of blast F. which is the development of the science of iron-smelting (q.v.). Hearth F. are sometimes employed in the air reduction process of smelting iron, but they are very wasteful and have little to recommend them.

Where the substance to be heated must not come into contact with the fuel itself, the operation of producing the heat must be performed in a special combustion chamber. This chamber is placed at the side of the hearth or working-bed, in which the material is exposed in a broad thin layer. The chimney is placed at the other end from the combustion chamber, and consequently the body of flame and the heated gas are drawn over the working-bed and beaten down by reverberation from the low vaulted roof which covers the hearth and the working-bed and slopes down to the base of the chimney. The term 'cupola' was originally used for the reverberatory furnace, but is now used to designate a small blast furnace, such as that used by iron-founders. The 'melting' reverberatory furnace is used in the concentration of poor metallic compounds into a regulus by fusion, in the reduction of lead and tin ores, in the refining of copper and silver, and in the puddling processes of making malleable iron. The 'calcining' or wasting type of reverberatory furnace has a less extended use. It

is employed chiefly in the conversion of metallic sulphides into oxides.

The most important of the F which are used in industry are gas F. Besides the furnace for which illuminating gas is used, on the Bunsen burner or blowpipe principle, and which are employed in small operations and in the laboratory, gas firing on a large scale is very extensively carried on. The origin of gas F dates back to the patents granted to J. Derrick and Wm. Siemens in 1856 and 1861, and no new principles have been

chimney so far as draught is concerned. The gas furnace is in general use in metallurgy to day, in the glass, gas, and by-products coke industries. It is also used in ceramics, though rarely. Its success is due to the easy regulation of combustion which can be made perfect without excess of air the possibility of a long flue and therefore of large F, and the use of fuel of inferior quality. The original perfection of the furnace, and the fact that regeneration permits high temp as well as economy have also



THE BLAST FURNACE AT THE FORD WORKS AT DAGENHAM
It is one of the largest in the world

added since that time. A gas furnace has, in general, the following parts: (1) The gas-producer, which may have its own draught apparatus or may form a close part of the furnace, and depend upon its chimney; (2) The inversion valves, which direct to one side or the other the products of combustion and the gases required for the firing of the furnace; (3) The chambers of recuperation utilizing those calories which would otherwise be carried away by the products of combustion; (4) The laboratory, or hearth, where the industrial operation is effected. The combustion of the fuel is here completed by a new influx of air, known as the secondary air; (5) The chimney, or the draught apparatus taking its place, discharged into the outer air the products of combustion, and at the same time ensures the circulation of the various gas currents. A number of dampers at the various flues of admission and exit complete the

contributed to its success. In the older methods of heating everything was confused. The old glass-pot furnace, for example, was formed of a hearth which contained the pots placed above the fire grate without a stack. The only way of regulating the draught was by varying the depth of fuel in the grate. Under such conditions a high measure of skill was needed to obtain a satisfactory result. In a modern gas-fired furnace, the grate, the hearth and the chimney, and the recuperator are all distinct and may each be controlled in a methodical way.

F in which coal-gas or hydrogen was burnt with pure oxygen were formerly used when the highest temps were required but electrically heated F are now largely used. The advantages of electricity as a heating agent are the possibility of local application of the heat and the high temps obtained; against these are to be set its enhanced cost



SHERATON

Satinwood side table (one of a pair) with serpentine sides and slightly cabriole legs.



CHIPPENDALE

Walnut desk chair with seat covered in leather

Electric F differ in type according as the product is to be obtained in the form of a gas, a liquid, or a solid (e.g. carbon disulphide, calcium carbide, and graphite). (For further particulars see ELECTRICITY and ELECTROLYTICITY.) For the casing, walls, pillars, etc., of F., ordinary building materials, such as red bricks are used, for the parts which come in contact with the fuel or flame, refractory or fire resisting materials are necessary. Such parts are the linings of fire places, arches, roofs, and flues, the lower parts of the chimney of a reverberatory furnace, and the whole of the internal walls of blast furnaces. A list of fire resisting substances may be given, for further particulars see under their names, fireclay and firebricks, certain sandstones, silica, in the form of garnet, diamond, stone and bricks, carbon (as coke and graphite), ferric oxide and alumina, in the form of bauxite. See also MELTING, IRON AND STEEL, ANNEALING, HARDENING, METALLURGY; SINTERING, etc. See also Mills and Rowan, *Fuel and its Application*, 1839; Baldwin, *Steam Heating for Buildings*, 1900; J. Wright, *Electric Furnaces and their Industrial Applications*, 1906; W. E. Gouraud Grumal, *Essay on a Theory of Furnaces* (trans.), 1913; H. Armstrong, *Fuels and Furnaces for Industrial Heating*, 1938, and H. Etherington, *Modern Furnace Technology*, 1944.

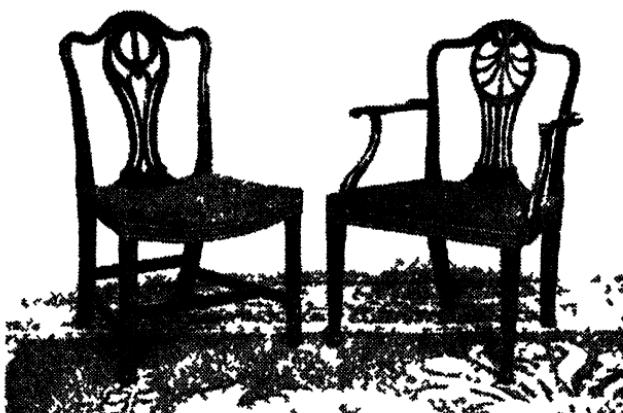
Furneaux Islands, also called Flinders. Group of is. between Australia and Tasmania in the Bass Strait and included within the state of Tasmania. Flinders, or Great Is., is the most important, others being Cape Barren, Clark, Hummock, and Babel. They were discovered in 1773

by Cook's lieutenant, Furneaux, from whom they take their name. They are for the most part barren and unproductive. Pop. 800.

Furnes (Flemish Veurne), tn. of Belgium in the prov. of W. Flanders. It is situated at the junction of several canals, 16 m. N.E. of Dunkirk and 27 m. S.W. of Bruges. The principal industries are the manuf. of linen and tiles; there is a trade in hops, corn, and dairy produce. Pop. 7600.

Furness, Sir Christopher F., first Baron (1852-1912), shipowner and shipbuilder, head of the shipping firm of F. Withy & Co. He was b. at Whitby, Hartlepool, Durham. He started a shipbroking business when he was twenty-four years of age. He next estab. the line of steamers. In 1885 he joined Edward Withy and founded the present firm. In 1910 he was raised to the peerage as a baron and took the title of Lord F. of Gstantley. He was Liberal member for the Hartlepools div., 1891-1910.

Furness, peninsula of N. Lancashire, England, situated between the Irish Sea and Morecambe Bay. The ruins of F. Abbey stand in a deep valley S. of Dalton and adjacent to the F. railway. It is interesting to artists and antiquaries, being a fine example of the transition Norman and early Eng. architecture. It was founded in 1127 and was, until the Reformation, a great and wealthy Cistercian abbey. The prin. tn. of F. is Barrow (q.v.), noted for its docks and iron works. **Furniss**, Harry (1854-1926), Eng. caricaturist; b. March 26, in Wexford; son of a Yorkshire engineer; at the age of nine-



Frank Partridge & Sons Ltd

Two pieces of a set of six - 1 and two arm-chairs the open backs with pierced splats and arms with backs, seats covered in horse-hair

teen settled in London, and soon after became a regular contributor of humorous drawings to the print illustrations papers. He joined the staff of *Illustration* in 1880 and for many years was one of its most popular illustrators. He leapt into fame with his invention of the Gladstone collar and became known all over the world for his picture (used since by Lever's Soap as an advertisement). Two years ago I used your soap since then I have used no other! An admirable humorist he illustrated with success the works of the two great humorists Thackeray and Dickens. Author of many books, including *Confessions of a Caricaturist*, 1901, and *Harry Furniss at Home*, 1903.

Furniture (from *Le Fournier*, to furnish) includes all movable goods such as fittings, vessels, etc supplied to buildings to adapt them to their use. Until the Renaissance days, household appliances were few and a luxury to their possessors. Indeed the peoples of antiquity were satisfied with a bed, a table, a couch and sometimes a chair for the best hours of their lives. They were spent out of doors and sedentary pastimes were few. Up to Roman times the woods most commonly used for domestic furnishings were first of all cedar, and then rosewood, ebony, teak, pine and walnut, whilst bronze and cloisonné, and the precious metals silver and gold and ivory, were more freely used for them than they are to day, under the empire wealthy Romans had golden cooking utensils. Still, wood has always been the basis of furniture, and that being so it is not surprising that few examples of early work have lasted to our day. The chief sources of information about Assyrian

and Egyptian household fittings and likewise about those of Greece and Rome are various sculptures and mural decoration and paintings. The cabinet makers of Nineveh, as also of Thebes and Memphis knew how to embellish their couches and tables with inlays of ivory, and were fond of upholstering their chairs and thrones on legs of wild animals, bulls, lions and rams were favourite devices for carving, and slaves usually captives in war were often degraded to the position of upholding some portion of the royal throne. The Greeks derived their mobiliary fashions from the Etruscans and the plutocrats of Rome patronised Gk. in preference to native workmen. Folding chairs, chairs with sloping, and upright backs elaborate footstool, bronze tripods, arm chairs with splashes for elbow rests, splendid marble tables and candelabra, oriental couches and all manner of bronze work damascened in gold and silver were common appendages in the palaces and sumptuous homes of the kings and aristocrats of classical antiquity. Roman fashions were copied by Byzantine craftsmen and under Charlemagne there flourished the Rheno-Byzantine school of art whose best work appears in their magnificent enamelled shrines and reliquaries. In the Middle Ages beds and chairs were still restricted to the upper classes, but in the castles and manor houses of the Norman barons household appliances were rapidly developed, both in number and artistic worth. Bedsteads were square in frame and roofed with panelled testers supported on carved posts, rich hangings and tapestries and decorated chests of Italian cypress were imported, and other chests

and portable presses were made at home with wrought-iron clasps and hinges and with inlaid wood or iron strap-work ornament, or sometimes with panels of tempera painting on gilt backgrounds. Chests were used as repositories for money and valuables, and also for eccles. vestments. When the family removed they served as trunks for all forms of apparel and costly fabrics, usually stored in massive wardrobes or *armoires*. It is, of course, from the chest that the modern *dressoir*, or sideboard, has developed.

Before passing on to the Renaissance one word must be said of Saracenic work. Omitting what they did for the interior of churches, the Saracens deserve every praise for the beauty and delicacy of their lattice work, and for their skill in inlaying, whether with silver filigree, brass, ivory, or mother-of-pearl. These merits are well illustrated by their tall hexagonal tables and cross-legged reading desks. After the great revival artisans no longer carved episodes from the cycles of romance or the legends of their saints, for these were swept away by the classical mythology which men so eagerly absorbed. During the Quattrocento period in Italy (1400-1500) sumptuous F. of every description was executed at the bidding of the Medici and other patron princes. Gilt grounds, *pietra dura* work, that is, the inlaying of slabs of coloured and richly veined marbles, and *tarsia*, or *cetrosina* work, or inlaying of wood in geometrical patterns or floral designs came quickly into vogue and spread rapidly across the Alps to other countries. During the reign of Henry VIII. Jean de Mabuse and Holbein introduced It. fashions into England, and in France, as the result of the infiltration of It. craftsmen, a mass of heavy and rich F. was made, but the frequent use of strap-work and the cartouche, which characterizes the Henri Deux style, is peculiarly Fr.

The so-called Jacobean style undoubtedly has its attractions, although it was overshadowed by the great *floraison* in F., which marks the eighteenth century throughout W. Europe. Like the famous 'great bed of Ware' of Elizabethan days, it is very solid and very heavy, both in design and in the thickness of the oak or chestnut which were the favourite woods; yet these qualities recommend themselves to many, and undoubtedly suggest a simplicity and strength absent from later work.

In this country the heyday of cabinet-making is associated with the names of Chippendale, Sheraton, and Adam, who raised the manuf. of F. to an art, to which they freely gave their talent both for execution and design. Their inspiration was clearly drawn from the Fr. artist Boulle, who owed his excellence in marquetry work to Florentine and Venetian craftsmen. These men had already shown the scope and beauty of the art. But marquetry did not originate in Italy: its home was the E., Damascus, Persia, and India, and thence it passed to Europe by way of the great trade routes. Boulle belongs to the Louis Quatorze period—

the *armoire* in the Jones collection at Victoria and Albert Museum, S. Kensington, London, is a beautiful illustration of his work—but though this period and the succeeding ones, the regency and the Louis Quinze or *rococo*, afford much that is both sumptuous and elegant, the cabinet-maker's art reaches its high-water mark just before the revolution, that is, in the reign of Louis XVI. In the S. Kensington Museum may be seen some splendid specimens of the exquisitely finished and truly choice work of Routgen, Riesener, and Gouthière, who enjoyed the patronage of Marie Antoinette. Gouthière was the first founder and chaser of his day, and used to mount in ormolu or bronze-gilt the elegant commodes and cabinets which the other two had made. These men turned their backs on the frivolous, rampant vagaries of Meissonier and the other apostles of the *rococo* school, and developed a beautiful restraint and delicacy accentuated by their preference for classic forms. Thus the 'riotous curves' of the du Barry period gave place to medallions and straight-lined patterns, which heralded a purer, nobler style. But the advent of Napoleon witnessed a backsliding, and F. became tainted with the dry and heavy classicism of the time. The best examples of the 'empire style' may impress and awe, but despite the richness of their woods—mahogany, satinwood, etc.—they are easily deficient both in charm and grace. In England after the death of Chippendale, the master of the *soi-disant* 'Chinese style,' and his compeers, there is little to note but a slavish, tasteless imitation of Fr. models. To-day an attempt is being made in *l'art nouveau* to reconstitute a naturalness and simplicity long since passed away. This style is marked by the popularity of various light oaks and may be said to draw all that is good in it from the lectures and teachings of Wm. Morris and his band of fellow workers. However, it seems at present as if the economic div. of labour, the substitution of machinery for hand labour, and the utter divorce of the designer from the artisan have wellnigh killed cabinet-making as an art. The finest collections of old F. are housed in the Louvre, the Victoria and Albert Museum, and Hertford House (the Wallace collection).

The manuf. of Amer. F. has developed along much the same lines as Eng., but it has been influenced by other European and by oriental styles in addition. The vogue for collecting 'antiques' in America leads only to the discovery of very primitive F. of a strictly utilitarian nature, chiefly for kitchen use. The early colonists naturally designed their F. on simple lines, and the woods they employed were for the most part pine, maple, oak, and the native nut-woods. Mahogany, rosewood, and black walnut were all greatly favoured in Victorian times. The F. of the late seventeenth and early eighteenth centuries showed such characteristic pieces as high-backed chairs, gate-leg and butterfly tables; while in Queen Anne's time appeared *sotos*, tallboys,

lowboys, cupboards, writing-tables, and chests of drawers in both walnut and maple. In the middle of the eighteenth century Chippendale F. in mahogany became the vogue, and, to a somewhat lesser extent, Sheraton, Shearer, Hepplewhite, and Robert Adam. Adam was an architect, but he believed in designing the F. for the houses he built or rebuilt, and this F. he ordered from Chippendale; Hepplewhite was also influenced by Adam. Later on Directoire and Empire styles were used as models for many graceful chairs, sofas, and other pieces of Amer. manuf. The leading cabinet-makers of early times were estab. in Philadelphia, with New York as second, and Salem as third in importance. In America, as in England to-day, the Cubist style has been developed as a passing novelty, and it has a certain amusing and bizarre charm of its own. See T. Chippendale, *The Gentleman and Cabinet Maker's Directory*, 1754; L. V. Lockwood, *Colonial Furniture in America*, 1902; W. Nutting, *Furniture of the Pilgrim Century*, 1921; H. Schmitz (ed.), *Encyclopaedia of Furniture*, 1926; O. Brackett, *An Encyclopaedia of English Furniture*, 1927; P. Macquoid, *English Furniture of the 16th-19th Centuries*, 1928; K. M. Kuhle, *Outline of Period Furniture*, 1929; J. P. Burke and A. E. R. Hopkins, *Old English Furniture for the Small Collector*, 1930; II. H. Taylor, *Knowing, Collecting, and Restoring Early American Furniture*, 1930; J. Gloag, *Time, Task, and Furniture*, 1930, *English Furniture, 1934-1948*, and *British Furniture Makers*, 1945; N. H. Moore, *Old Furniture Book*, 1935; D. Smith, *Old Furniture and Woodwork*, 1937; R. Edwards, *Sheraton Furniture Design*, 1946, and *Hepplewhite Furniture Designs*, 1947; R. W. Symonds, *Chippendale Furniture Designs*, 1948; H. Gordon, *Old English Furniture*, 1948; and J. and R. Hooper, *Modern Furniture and Fittings*, 1949.

Furniture Cream, mixture used for polishing chairs and sideboards, etc. Beeswax and resin are dissolved in heated turpentine and then mixed with solution of powdered soap and carbonate of potash. When applied to wooden surfaces, the oil dissolves the former polish and the other constituents make a new one.

Furnivall, Frederick James (1825-1910), Eng. philologist and editor. He founded seven societies for the promotion of literary appreciation and for the pub. of texts. These were the Early Eng. Text Society (1864), the Chaucer (1868), Ballad (1868), New Shakespeare (1874), Browning (1881), Wyclif (1882), and Shelley (1886). By means of these associations he collected as much as £30,000, which was expended in issuing cheap eds. of a number of early texts and rare works of literary merit, which thus became accessible to a large circle of interested students. Many of the texts were ed. by F. himself, but his great work as editor was his issue of *A Six-text Print of Chaucer's Canterbury Tales in Parallel Columns* (1868-75), which was an exact replica of six original MSS. F. further supervised the pub. of a series of

facsimiles of the quartos of Shakespeare's plays, and for some years was ed. of the Oxford *New English Dictionary*, later under the care of Sir J. A. H. Murray. Besides his earnest and unremitting labour in the literary field, F. was in his day a splendid oarsman, and in 1885 introduced races for sculling fours and eights. See *Frederick James Furnivall: a Volume of Personal Recollections* (reminiscences) by forty-nine contributors, with a biography by J. Munro, 1911.

Furnival's Inn, see INNS OF COURT.

Furruckabad, see FARRUKHABAD.

Furs, term used generally to cover the skins of animals complete with the outer covering of wool and hair, are used for the manuf. of coats, ties, and trimmings.



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PLATINA FOX, RAISED IN CAPTIVITY

Fur-bearing animals are found widely distributed throughout the world, but with some exceptions the finest are obtained from the colder regions of the N. hemisphere. The animals should be taken when the weather is coldest, as then their fur is most fully developed—that is in winter or early spring in the case of water animals. F. present a considerable variety of colour, texture, and pattern; after dressing, some are used in a more or less natural state, whilst others are dyed and submitted to various processes before being manufactured into coats.

Fox.—The silver fox occurs in the wild state as a mutant of the red fox, and exhibits colour phases varying from pure black to a complete covering of silver guard hair. Wild silvers are comparatively rare, but the animal has been raised in captivity since 1908, and silver fox ranching is now an extensive industry, particularly in N. America, the Scandinavian countries, and Russia. Cross fox occurs in red fox litters, and its distinctive feature is a dark cross on the

shoulders. White fox is found mainly in the Arctic circle and Siberia, is pure white in colour with deep, dense fur, and is used for making capes, trimmings, etc. Most is dyed, particularly with the light pastel shades. Red fox is found in practically every country N. of the equator. It varies in colour from yellow to dark red, and is often dyed and used extensively for trimmings. Blue fox is found in the Arctic regions of Canada, Alaska, and Greenland, is bluish in colour, and used to make capes and stoles. It is farmed extensively in Scandinavia.

Weasels.—Fisher is the largest species of the weasel family, and has very fine, silky hair, which is a dark brown in colour. This is a highly prized and very valuable fur, found only in N. America. Badger is found in the N. Amer. continent, Europe, and Asia. The hair is silvery grey in colour, and those from N. America are used for trimming, etc., and the European and Asiatic skins for brushes. Ermine is found mainly in Canada and Siberia, and is creamy white in colour, with a black tip to the tail. Marten is a fine and valuable fur used for capes, stoles, etc., found mainly in Canada, and varying in colour from yellow to dark brown with soft, silky fur. It is the Canadian counterpart of Russian sable. Sable is the most costly and prized member of the weasel family, and is found in most parts of Russia. It has the same characteristics as the Canadian marten, but is smaller, with better colour and quality of fur. Skunk is found in N. and S. America, and is black in colour. Many have white stripes, which are cut out or dyed before the fur is used.

Rodents.—Beaver is found mainly in Canada and N. U.S.A. The best types come from E. Canada; they are brown in colour, and are not used in their natural state. The top hair is plucked, and the under fur is sheared to make coats, etc. There are three main types of muskrat recognised by the fur trade: (a) Canadian and Amer., which varies from golden to dark brown in colour, and has thick underwool with short top hair, and is used naturally and dyed for coats, etc. (b) Black, which is found mainly in E. America; apart from being black in colour its characteristics are as (a). (c) S., which is found in Louisiana and Texas, and has brown underwool and black top hair, otherwise with the same characteristics as (a) and (b). Marmot is found mainly in Mongolia, and is generally used as a cheap imitation for mink. Nutria is native to S. America, and is an inferior species of the beaver. It is also raised in captivity; the top hair is plucked or sheared, leaving soft brown underwool. Squirrel is found in all parts of the N. hemisphere, but the largest quantities come from Russia and Canada. The finest come from Russia, and are grey-blue, and very well furred. The Canadian type are weaker and of a red-brown hue. They are dyed and manufactured into coats.

Cat.—Leopard is found principally in India and Africa, the best types coming from Somaliland. The hair is short and

the best bear a well-defined pattern of black rosettes on a clear yellow background. House cat is found in almost all countries; it is of many different colours, and is used for cheap coats, trimming, etc. Lynx is found mainly in Canada, a few coming from Siberia. It is the most beautiful of the cat family, having long, silky fur of a silvery grey colour, and is used for trimming.

Pitch.—This is a species of ferret found in Europe and Asia. The colour varies from dark brown to yellow (found in Europe) and white to pale brown (found in Asia). It is used to make cheap coats, etc.

Mole.—This is a small insect-eating animal with soft, velvety, blue-black fur, which is found throughout the N. hemisphere. It wears badly and is not in great demand.

Opossum.—Each country produces a different type, but in the main they have creamy white underwool with darker, somewhat silvery, guard hair, and are found in N. and S. America, Australia, and New Zealand.

Pony.—The ponies used by the fur trade come mainly from S. America and Russia. They have short, coarse brown hair, the short-haired variety with a moiré pattern being recognised as the finest.

Raccoon.—These are found in America and Canada, are reddish-brown in colour, and have thick, woolly fur, used for trimming, coats, etc.

Mink.—The most desirable types of wild mink are found in Canada and N. America. The fur varies in colour from light to dark brown, and is of a dense, even, silky texture. Its prin. use is for manuf. into coats. Mink are also raised in captivity, and the best of the ranched types compare very favourably with the wild types. In recent years few varieties have been developed. They are known collectively as mutation mink, of which the most valuable are silver blue, pastel, and white.

Seal.—There are two types, which are found in most oceanic regions: (i) Fur seal, which is taken mostly in Alaska, where the animal goes to breed. It has coarse, silvery top hair and very soft underwool which, when the top hair has been removed, is dyed and used for coats, etc. (ii) Hair seal, which is found mainly in the N. hemisphere, and is characterised by its absence of underwool.

Lamb.—There are very many varieties of lamb which are used by the fur trade. The types most commonly used are the Persian and Indian lambs. Persian are indigenous to Bokhara, Afghanistan, and Samarkand, but are now extensively found in S. Africa, whence come most of the skins used commercially. The wool is curled, and the value of a skin depends on the size, lustre, and pattern of the curls. The majority are black, but grey, white, brown, and mottled varieties also occur. Indian lambs are not so fine as Persian, and are mainly white in colour, though some are brown, black, or mottled, the curl being flat and open, and the skins are used for coats, etc.

See H. A. Innis, *Fur Trade in Canada*, 1930; F. Merk, *The Fur Trade*, 1931; F. Moloney, *Fur Trade in New England*, 1931; C. T. Williams, *Modern Fur Farming*, 1934; and B. A. de Voe, *Across the Wide Missouri*, 1948; and *The British Fur Trade Year Book*.

Furze. Charles Wellington (1868–1904), Eng. painter, b. at Staines. His first exhibit in the Royal Academy was a vigorous picture called 'Cain' (1888). All his pictures are free from restraint, especially those whose subjects are of outdoor life, such as 'Diana of the Uplands,' which breathes of the fresh wind. Many of his works show a tendency to be decorative, and his mural decorations for the tn. hall at Liverpool are excellent both in composition and proportion. Among his other pictures are 'The Return from the Ride,' 'The Lilac Gown,' 'Cubbing with the York and Ainsty,' etc. His early death was a serious loss to Brit. art.

Fur Seal, or Sea Bear, belongs to the Otaridae, or sea-lions, as opposed to the Phocidae or true seals. F. Ss. are divided into N. and S. herds, the latter of which are almost extinct. But the *Otarus ursinus* of the N. Pacific, especially of the Commander and Pri. (or Pribilof) Is. in the Bering Sea, are still comparatively plentiful. These is. were leased by the U.S.A. to the Alaska Commercial Company (1870–90), and afterwards to the N. Amer. Commercial Company, whose monopoly, however, expired in 1910. The adult bull is 6 ft. long, with a girth of 4½ ft. In its seventh year it weighs about 450 lb. Its fur is dark brown, but that of the female, which is much smaller and weighs only 80 lb., is often fairly light. Seals feed in deep water chiefly on small fish rather like smelts, and on Alaska pollack and squid. Their breeding-ground are the rock-strewn ls. shores. The bulls arrive in May and the cows in June, the pup is b. soon after the cow's arrival, and by the winter-time (Nov.) is ready to swim away with its mother, the bulls having already (in Aug.) gone to sea to feed. In their winter migrations the Commander seals penetrate to the lat. of S. Japan, and the Pribilof as far as S. California. It is the custom of the young bachelor seals to sleep away from the 'rookeries.' Those who hunt them for their fur surround them in gangs by night, and drive them inland to the killing ground, where they knock them down with clubs. This method of trapping has been superseded by 'pelagic sealing,' that is, pursuit in open waters with spear or shot gun. Pelagic hunters, however, have killed male and female indiscriminately, with the result that the species is fast dying out. Various commissions have tried to remedy this abuse. Land sealing on the Pribilof and Commander Is. from 1868 to 1897 resulted in a catch of 3,382,949 and pelagic sealing of 963,529. The gov.-owned fur-seal herd of the Pribilof Is., administered by the dept. of commerce, comprises about 85 per cent of the F. Ss. of the world. This herd contained about 2,338,000 animals in 1941.

Fürst, Julius (1805–73), Ger. orientalist,

b. at Zerkowo. He was of Jewish descent, and many of his works are Judaic in character. He pub. a considerable number of works on oriental languages and literature, including *Concordantia Veteris, Testimenti Hebraicæ et Chaldaicæ* (1837–1840), an Eng. trans. of which appeared in 1871; *Kultur und Literaturgeschichte der Juden in Asien*, vol. I., (1849); and the famous *Bibliotheca Judaica* (1849–63).

Fürstenberg, tn. of Brandenburg, Germany, situated about 60 m. E.S.E. of Berlin. Pop. 7000.

Fürstenwalde, tn. of Brandenburg, Germany, situated on the Spree, about 21 m. W. of Frankfort-on-Oder. It is noted for manuf. of machinery, gas and electric light fittings, and has breweries. Pop. 25,700.

Furth, tn. of Bavaria, Germany, situated near the Bohemian frontier, about 40 m. N.E. of Ratibon. Its chief industries are the manuf. of glass and toys. Pop. about 6000.

Furth, tn. in the prov. of Middle Franconia, Bavaria, Germany, situated about 5 m. N.W. of Nuremberg at the junction of the Regnitz and Pegnitz. Its manuf., which are similar to those of Nuremberg, include mirrors, toys, gold leaf, pencils, optical instruments, furniture, and chicory. The first steam railway in Germany was between F. and Nuremberg, opened in 1835. Pop. 75,000.

Further India, see INDO-CHINA.

Fur Tribe, see DAKKUR.

Furtwangler, Adolf (1853–1907), Ger. archæologist, b. at Freiburg-in-Breisgau. He took part, 1878–79, in excavations in Olympia. Assistant in Berlin museums, 1880; prof. and keeper of antique records, in Munich, 1894. In 1901–7 he undertook excavations in Ägina, Amyklæ, and Orchomenos. Wrote *Meisterwerke der griechische Plastik* (1893); *Die antiken Gummien* (1900); *Griechische Fasenmalerei* (1900); *Aigina* (1906); and *Klassische Schriften* (1912–13).

Furtwangler, Wilhelm (b. 1886), Ger. musical conductor; b. in Berlin, son of Adolf F. (q.v.). Studied in Munich; was in the court theatre under Motti, 1911–15. Conducted opera in Munich, and 1915–19 in Mannheim. Conducted, 1920–22, symphony concerts of Berlin state orchestra, and Frankfurt museum concerts; and, 1922–27 (as successor to Nikisch), Leipzig Gewandhaus concerts. Conductor of concerts of Gesellschaft der Musikfreunde, Vienna, 1921–30. Conducted at Philharmonic concerts, New York, 1926–27; Vienna Philharmonic concerts, 1927–30; director of the Berlin Philharmonic concerts, 1923–34, and from 1935; of the Berlin state opera, 1933–34; permanent guest conductor, Vienna Philharmonic orchestra and Vienna state opera; conductor, Bayreuth festival, 1931, 1938, 1937. Since Nikisch's death chief Ger. conductor. A Ger. denazification tribunal, in Dec. 1946, accepted F.'s application to have his name and record cleared, on the ground that his return to musical life in Germany after Hitler came to power was due to misunderstanding of the conditions in Nazi Germany. The tribunal thought

that F. took this step to serve Germany's cultural interests. See monograph by O. Schrenk, 1940, and F. Herzfeld, 1941.

Furze, name given to sev. species of the leguminous genus *Ulex*, which occurs in Europe and Africa. There are three species known in Britain, *U. nanus*, *U. Gallii*, and *U. Europaeus*, and they are called also whin and gorse. They are all bushy shrubs with reduced leaves and many reduced branches; the bright yellow flowers make gay the bare heaths from early summer. The fruit has a curious explosive mechanism.

Fusan, or Pusan, important seaport on the S.E. shore of Korea, is the terminus of the railway from Seoul. This treaty port was opened to Jap. trade in 1876 and later on to foreign trade generally. The tn. consists of two parts, the native part and the Jap. settlement, which is the new part. The chief exports are rice, beans, hides, and silks, while cotton goods and Jap. goods are imported. The fisheries are also of some importance. It has a good harbour. Pop. about 180,300.

Fusaro, Lake of, lake of Italy, situated about 11 m. W. of Naples. It is the Acherusia Palus of Rom. times, and is near the ruins of Cumæ. It is also famous for oysters.

Fuse, or **Fuze**: 1. Contrivance for igniting the explosive element in a shell or blasting cartridge at the required moment. A F. may be required to be instantaneous, or it may be designed to delay the explosion. Fs. used for blasting purposes are either slow-burning or electrical. In the former case a cylindrical packing of linen with a core of gunpowder is used. As ordinarily prepared, this burns at the rate of about 2 ft. per min., and takes effect on the detonating cap which then explodes the main charge. An electrical F. is constituted by inserting the ends of two insulated copper wires in the detonating cap. The wires are then attached to long wires leading to a battery deposited some distance from the scene of the explosion. Fs. for service shells are either percussion or time F.s. Percussion Fs. are actuated either by the pressure of the gases behind the shell, or by the rotation induced by the rifling, or by the impact of the shell when it reaches its destination. Where the F. is actuated by the forces acting upon the shell at the moment of discharge, it means that a needle is set free or unlocked, so that it causes the explosion of the detonator when the shell strikes. If the F. is operated by direct impact only, it must necessarily be of sufficient strength to prevent explosion at the discharge of the gun. Time Fs. were formerly made of wood; their action depends upon two channels of slow-burning F. composition which is ignited by the discharge of the gun: these channels are movable with respect to each other, so that the distance from the point of first ignition to the magazine may be adjusted, thus determining the time to elapse before the explosion of the shell. 2. In electricity a thin wire (usually made of copper but sometimes of tin or an alloy) inserted in

an electric circuit from considerations of safety. If the current in the circuit is too large the F. wire becomes hot and melts, thus breaking the circuit and preventing the flow of the current. Fs. are mounted in insulating holders of porcelain, glass, or the like. For larger currents they are replaced by circuit breakers which work magnetically.

Fuze, or Fuzee, see HUROLOGY.

Fusel, or **Fousel**, **Oil**, also called Potato Spirit, consists chiefly of amyl alcohol ($C_4H_{10}O$), but with it are also mixed butyl and protyl alcohol. It is a colourless fluid with an oppressive smell and a burning taste. Commercially it is used for making peardrops and other forms of amyl acetate for flavouring purposes, patent varnishes, and essential oils. When potatoes, rye, and barley are fermented and the liquor distilled, it will usually be found to contain F. O., which becomes gaseous at a higher temp. than either alcohol or water. It is a constituent of most inferior spirits, but is not poisonous, though it produces undesirable physiological effects.

Fuseli, or **Fusoli**, **Henry**, or **Fuessli**, Johann Heinrich (1742-1825), artist and writer, b. at Zurich. He studied art in Italy, and then took up his residence in London, where he was known by the name of Henry Fuseli. He was elected R.A. in 1790, and about 1798 became a prof. of painting at the academy. His pictures, which testify to his wonderful imagination, are somewhat lacking in their method of execution. He painted 'The Nightmare' (1782), and illustrations for both Shakespeare's and Milton's poetry. He wrote *Lectures on Painting* (1801-20). His collected works, with a life by J. Knowles, were pub. in 1831. See P. Ganz, *The Drawings of Henry Fuseli*, 1919.

Fushiki, or **Fushigi**, seaport of Japan, on the W. coast of Honshu, about 32 m. N.E. of Kanazawa. It was made an open port in 1889. Pop. 35,000.

Fushimi, tn. of Honshu, Japan, about 6 m. S.E. of Kioto. Here was fought a battle between the imperialists and the followers of Shogun in 1968. Pop. 31,000.

Fusible Metal, general term applied to certain bismuth alloys which have a particularly low melting point. The chief varieties are (1) Newton's metal, containing 8 parts of bismuth, 5 of lead, and 3 of zinc; melting point 95° C. (2) Darcel's metal, containing 2 parts of bismuth, 1 of lead, and 1 of tin; melting point 94° C. (3) Rose's metal, containing 25 parts of bismuth, 14 of lead, and 14 of tin; melting point 94° C. (4) Wood's metal, containing 4 parts of bismuth, 2 of lead, 1 of tin, and 1 of cadmium; melting point, 67° C. A useful property of these alloys is that they expand on cooling, and therefore give a sharp definition when used for type-founding, stereotyping, etc. Such metals are also used as safety plugs in steam-boilers, when, if the water level falls too low, they are melted and act as a safety valve.

Fusiliers, originally soldiers armed with a 'fusil' or lighter musket than the rest of the infantry. As all Brit. regiments

now carry rifles of one pattern, the term F. has only an historic significance. See also under the names of the various regiments: LANCASHIRE FUSILIERS; ROYAL FUSILIERS; SCOTS FUSILIERS, ROYAL; WELCH FUSILIERS, ROYAL, etc.

Fusi-Yama, see FUJI SAN.

Fust, Johann (d. 1486), wealthy burgher of Mainz, Germany, associated with Gutenberg and Schoffer, to whom, with them, the invention of printing has been ascribed. A masterpiece of this partnership was a Lat. psalter, 1457, the initial letters in which were printed in red and blue. It is sometimes supposed to have been the original of the Faust legend.

Fustel de Coulanges, Numa Denis (1830-89), Fr. historian, b. in Paris. He was prof. at Amiens, Paris, and Strasburg, etc.; in 1870 was appointed to the Ecole Normale, Paris, and afterwards became a prof. at the Sorbonne. His most famous work is *La Cité antique* (1864, trans. into Eng., 1874). Other works are *Histoire des institutions politiques de l'ancienne France* (1875-92); *La Gaule romaine et le royaume des Francs* (1888-91); *Nouvelles Recherches sur quelques problèmes d'histoire* (1891); *Questions historiques* (1894). * P. Giraud, *Fustel de Coulanges*, 1896, and L. E. Champion, *Les Idées politiques et religieuses de Fustel de Coulanges*, 1903.

Fustian, cotton fabric. The name is an old one, said to be derived from El-Fustat in Cairo. During the Middle Ages women's apparel and priest's vestments were made of F., but to-day the material is commonly used for labourers' clothes. It is the cotton equivalent of silken velvet, and is variously known as velveteen, corduroy, and moleskin. Jean, which is a thick tweed, or twilled, cotton cloth, is one kind of F., and corresponds to satin in silk stuffs. F. is dyed many colours, mostly dark.

Fustic, name of two dyestuffs. Old F. is the wood of the *Macluia tintoria*, a tree indigenous to the W. Indies and Brazil. The dye from it is yellow, and was widely used before the introduction of anilino dyes for animal fibres, especially wool. Young F. is the wood of the smoke plant, *Rhus colinus*; as a dye the yellow colour derived from it is very fugitive to light, but it is much employed in tanning operations.

Futa-Djalon (Fouta Djallon), dist. of Fr. Guinea, W. Africa, having an area of about 42,500 sq. m. It stands at an elevation of about 4000 ft., with beautiful scenery and a pleasant climate. The chief productions are rattle, gold and other metals, rice, and cotton. Its chief rvs. are the Sene-gal and Gambia, both of which rise here, while the cap. is Timbo and Tulu is the largest city. Pop. about 700,000. See also FRENCH GUINEA.

Futa-Toro, ter. of W. Africa in the N. portion of Fr. Senegal. It produces large quantities of pig-iron and tamarinds. Pop. about 120,000.

Futehgungs, see FATEHGANGJ.

Futhore, see RUNES.

Futtehghur, or Fatehgarh, tn. on the r. b. of the Ganges in the dist. of Faruk-

habad, India. With the tn. Farukhabad it forms a joint municipality, and is not only the civil cap., but also a manufacturing centre for cotton prints, gold lace, tents, and metal utensils. It has also a gov. gun-carriage factory and a military cantonment. During the mutiny (1857) more than 200 of the European residents were massacred. Pop. 70,000.

Futtehpur, see FATEHPUR.

Futtigarh, see FATEGARH.

Futtipoor, tn. In the plain of the Ganges, India. It is the cap. of a dist. in the United Provs. of Agra and Oudh. It is situated 18 m. by rail S.E. of Cawnpore. It has many fine public buildings, and is especially noteworthy for the very beautiful mosque which it possesses. Pop. about 15,000.

Futures, commercial term applied to the purchase of a commodity (merchandise, stocks and shares) with a view to delivery at a future date. The practice lends itself to speculation in that a person may sell in the hope that by the time of delivery the price will have fallen and he can repurchase at a cheaper rate.

Futurism. This movement was founded in 1909 by the It. poet, Filippo Tommaso Marinetti, and spread to art and music, as well as to letters. In 1911 Marinetti pub. his work *Le Futurisme*, and in Feb. of that year he arranged an exhibition of the work of five It. painters in the Bernheimjeune gallery in Paris. These artists, Umberto Boccioni, Carlo D. Carrà, Luigi Rosso, Giacomo Balla, and Gino Severini, issued a 'profession of faith,' in which they stated that they were young and their art was of a violently revolutionary nature; they expressed their strong hatred of the academic in art, and showed that their aim was to portray movement. Painting and sensation, they declared, were inseparable words, and that 'what must be rendered is dynamic generation—that is to say, the particular rhythm of each object, its inclination, its movement, its interior force . . . we thus arrive at what we call painting of states of mind (*la peinture des états d'âme*).'. In the summer of 1913 (June 20 to July 16) Boccioni organised an exhibition of his own works, his paintings and sculptures; but in later years he developed a different and more intelligible style, which showed him as a sculptor of note. See also SURREALISM. In 1920 Marinetti issued *I Manifesti del futurismo* in 4 vols. in Milan. See G. Concioli, *Cubistes, Futuristes, Passéistes*, 1914, and R. Wilenski, *The Modern Movement in Art*, 1927.

Fuze, see FUSE.

Fuzuli (d. 1562), Turkish prose writer, see TURKEY, Literature.

Fylfot, see SWASTIKA.

Fyn, second largest is. of Denmark, see FUNEN.

Fyne, Loch, inlet of the sea in Argyllshire, Scotland, extending in a northerly and north-easterly direction from the sound of Bute, some 6 ., beyond Inveraray, having the dist. of Cantire on the W. and Cowal on the E. On its W. also is Loch Gilp, and the tn. of Inveraray is on this side of the loch. It is famous for its herrings.

Fyzabad, see FAIZABAD.

G

G, seventh letter of the Eng. alphabet. The Semitic *gimel* (-Gk. *gamma*) passed through the Etruscan alphabet to Lat. and became C originally employed for both k and g (see under C). At a later stage a change (attributed to Appius Claudius Censor in 312 B.C.) was adopted to denote the voiced guttural stop g. This consisted in the addition of a bar to the lower end of C, thus converting it into G. This letter was placed in the position of the zeta in the Gk. alphabet, which was dropped (see under Z). At a later period the Lat. g was palatalised before front vowels. O.E. G may be considered under three headings: (1) As an explosive or stop. It was a voiced guttural stop in the forms *ng*, *gg*, developing into hard g (cf. O.E. *singan*, *frogge*; Mod. E. *sing*, *frog*). When *ng*, *gg* was followed by i or j, it was a voiced palatal stop, developing into the sound *dje* (cf. O.E. *sengean*, *ege*; Mod. E. *singe*, *edge*). (2) As a spirant G was a voiced guttural spirant initially when followed by an original guttural vowel (a, o, u) or by a consonant, and medially when following an original guttural vowel or a consonant. Initially it developed into Mod. E. hard g, except before n, when it became silent (cf. O.E. *gbs*, *grisan*, *guagan*; Mod. E. *goose*, to grip, to gnaw). Medially it became palatalised (cf. O.E. *burgu*; M.E. *burwe*; Mod. E. *borough*). Finally (i) was a voiceless guttural spirant when following a guttural vowel or consonant, and often was vocalised to h. It is present in Mod. E., but is silent or pronounced as an f (cf. O.E. *hēah*, Mod. E. *high*; and O.E. *geniūg*, *genōh*, Mod. E. *enough*). Initially before, and medially and finally after, an original palatal vowel G was a voiced palatal spirant. Initially it developed into Mod. E. v, otherwise becoming vocalised to i (cf. O.E. *zielðan*, *daeg*; Mod. E. *yield*, *day*). (3) O.E. G also represented the Germanic j, and as such was always a palatal spirant, represented in Mod. E. as y (cf. O.E. *yeong*, *yea*; Mod. E. *young*, *yea*). The M.E. symbol z, used through Fr. influence, was used much later in Scotland than in England, and may still be noted in such words as *caperczie*, *Menzies*. To the forms of Mod. E. G already noted may be added the hard g before e, i in words of Teutonic origin, e.g. *gire*, *get*, and in Heb. proper names, *Gilead*, *Gehenna*. As an initial preceding n G has become silent, and gn is sounded in many words of Fr. origin as *sign*, *feign*. It may or may not be pronounced hard medially, e.g. *singer*, *younger*. See also ALPHABET.

G, in music is the fifth tone of the natural diatonic scale of C.

Gaba Tepe, headland on the E. end of the Gallipoli peninsula in Turkey, between Suvla and Krithia. During the First World War the Australian and New

Zealand Army Corps, under the command of Gen. Birdwood, landed just N. of the headland on April 25, 1915. The Turks attacked heavily in this locality, but failed to move the Brit., who, however, made little progress, and finally withdrew in the following Dec. See GALLIPOLI CAMPAIGN.

Gabbard, Battle of the, naval battle fought during the first Dutch war (1652-1654) between an Eng. fleet of 105 vessels, with 16,000 men, under Adm. Blake, and a smaller Dutch fleet under van Tromp. The decisive engagement was fought on the second day of a two-day battle when nineteen of the Dutch ships were sunk or captured with the loss of 3000 seamen killed or wounded. Though won by Blake it was one of his hardest fights. See D. Mathew, *The Naval Heritage*, 1915.

Gabbatha, place of Pontius Pilate's judgment seat. It was erected when he pronounced sentence on Christ (John xix. 13), and stood outside the pretorium, for sentence had to be pronounced in the open.

Gabbro, group of basic igneous (plutonic) rocks. They have a completely crystalline granitoid texture, and usually occur in association with the crystalline schists at large amorphous masses or bosses. The chief mineral constituents are plagioclase, generally a soda-lime or lime felspar - labradorite being the commonest, though anorthite is often present in abundance - together with hornblende, augite, magnetite, and sometimes olivine. Apatite is almost invariably present. Generally the felspar is embedded in great crystals of augite which have evidently developed last of all. The composition of these rocks shows from 45 per cent to 55 per cent of silica and a large proportion of lime and magnesia. The proportion of alkalies is small. There are G. areas in Cornwall, in Ayrshire, in Mull, and in Skye, and they occur usually in a somewhat central position surrounded by masses of basic lava, such as basalt. The composition of G. bears a very close resemblance to that of dolerite.

Gabelentz, Hans Conon von der (1807-1871), Ger. philologist, b. at Altenburg. Said to have been master of eighty languages. Wrote treatises on a number of them, his chief work being on the Melanesian.

Gabelle (Low Lat. *gabulun*, a tax), term applied in France to a tax on various articles, but more particularly to the tax on salt. It was first levied by Philippe IV. in 1286, and was made permanent by Charles V. It compelled all above the age of eight to purchase, every week, a fixed quantity of salt at a set price. It was always most unpopular, and was finally abolished in 1789.

Gabelsberger, Franz Xavier (1789–1849), b. at Munich, inventor of a Ger. system of shorthand. The formation of his signs in shorthand corresponded as far as possible with the written characters of the Ger. alphabet, and his method is still used in Ger.-speaking countries.



John H. Stone

GABLE

A fir house at Forthampton, near Tewkesbury, Gloucestershire

Gaberlunzie, old Scottish name for a beggar or tinker, who was so called from his wallet. Scott's Edie Ochiltree in the *Antiquary* is a good example of the professional beggar. Tradition has it that the author of the song or ballad entitled *The Gaberlunzie Man* (see *Percy Reliques*) was King James V. of Scotland, who was noted for strolling about his dominions in the disguise of a tinker or beggar.

Gabers, see *GUT BRES*.

Gabes, see *ABIL*.

Gabii, anc. tn of Latium, situated on the Via Gabina, about 12 m. from Rome. It played an important part in the expulsion of the Tarquins. It was famous for its baths, and the Emperor Hadrian built a senate house (Curia) and an aqueduct there.

Gabinius, Aulus, one of the Rom. tribunes in 67 B.C. He was a partisan of Pompey and it was through him that Pompey secured his 'extraordinary' command in the E. He proposed that a magistrate should be appointed who should be absolute master in all maritimo affairs of Rome. The measure was supported by Caesar in opposition to the Senate, and carried. In 58 B.C. he was consul, and supported the tribune

Clodius in his free distribution of corn. He was made governor of Syria in consequence, and in 55 B.C. restored, on his own responsibility, Ptolemy Auletes to the throne of Egypt, receiving for this a bribe of 10,000 talents. In 54 B.C. he was condemned for prov. misgovernment. In 49 B.C., at the outbreak of the civil war, he supported Caesar against Pompey.

Gabirol, see *AVICEBRON*.

Gable, triangular-shaped piece of wall closing the end of a double-pitched roof. It is a decorative feature of Ger. renaissance and of Elizabethan architecture in England.

Gablonz, see *JABLONEC NAD NISOU*.

Gaboon, or Gabun, dist. on the W. coast of Africa, which forms part of Fr. Equatorial Africa. It was discovered by Spaniards in the fifteenth century and received its name from its fancied resemblance to a cabin. The Fr. first settled there about 1842. It has an area of about 105,000 sq. m., and its chief rvs. are the Ogowe and the G. The surface is flat near the coast, but behind this rises to a plateau at a height of 3000 ft. The climate of the coast is unhealthy, that of the plateau is better. The natives grow manioc, bananas, nuts, and tobacco, while the Europeans cultivate coffee, cocoa, and vanilla. The chief exports are coffee, india-rubber, ivory, and palm oil and nuts. In the Second World War, in 1940, after the collapse of France, the dist. espoused the cause of the Free Fr. under Gen. de Gaulle. Pop. 421,000. Cap. Libreville. See also *FRENCH EQUATORIAL AFRICA*.

Gaboriau, Emile (1835–73), Fr. writer of detective novels, was b. at Saujon. He began by writing for the Parisian papers and became famous at once when his story *L'Affaire Lerouge* was pub. in 1866 in *Le Pays*. He quickly wrote others: *Le Crime d'Orcrail* (1868); *Monsieur Lecocq* (1869); *Les Esclaves de Paris* (1869); *La Vie infernale* (1870); and *L'Argent des autres* (1874).

Gabriel (Heb., man of God), archangel who explained to Daniel the vision of the ram and the he-goat, who appeared to Zacharias to announce the birth of John the Baptist, and to the Blessed Virgin to announce the birth of Christ. He is called archangel by both Jewish and Christian writers and is mentioned in the book of Enoch as the one who is set over 'all the powers.' The Targum assigns to him the destruction of the host of Sennacherib, and in the Koran his special work is divine revelation. Indeed he is still given the titles of Holy Spirit and Spirit of Truth by the Muslims.

Gabrosentum, see under *GATESHEAD*.

Gabun, see *GABOON*.

Gad, seventh son of Jacob by Zilpah, the handmaid of Leah and founder of the Israelitish tribe which is described in Genesis as a 'plundering troop.' When the Israelites left Egypt they settled to the E. of Jordan close to the dist. inhabited by the tribe of Reuben, their ter. including Gillead. They have a character for bravery; eleven of the tribe of G. came to the assistance of David when he most

Gadad. G. is also the name of a seer of King David, as well as of the god of luck or fortune.

Gadag, or Garag, important railway centre and manufacturing tn., 42 m. E. by S. of Dharwar, in the dist. of Dharwar, Bombay, India. Pop. about 41,000.

Gadames, or Ghadames, tn. and oasis in N. Africa situated on the N. border of the Sahara, about 300 m. from Tripoli on the frontier of the Algerian and Tunisian ter. of the S. and Tripoli. The tn. had its origin from the hot spring which probably made the Romans visit it about 20 B.C., when it was captured by Balbus and called Cydamus. It is important for its caravan trade, and its gardens produce apricots, dates, and figs. The inhab. are chiefly Arabs and Berbers. Captured by Gen. Leclerc's expeditionary force on Jan. 26, 1943 (see FEZZAN). G. is the mysterious city, the citadel of Islam, into which no white man had succeeded in penetrating before the beginning of this century, and for the first four decades few ventured to go there. The marquis de Mores, a coeval of Pétal (q.v.) at St. Cyr, was murdered there by fanatical Moslems. The white fathers who had tried to catechise the natives of G. had been assassinated one after the other. The Its. only risked their lives with considerable mistrust in this restless tn. Relatively strong It. forces were holding the tn. when the Free Fr. forces appeared and, without striking a blow, took the It. garrison prisoners of war. Pop. 7000.

Gadara, anc. tn. of Syria, situated to the S.E. of the sea of Galilee, and one of the Decapolis cities. It was originally a Gk. city, but is said to have been captured by Antiochus of Syria in 218 B.C. Some years after it was besieged and partly destroyed by Jaunaeus, but it was restored by Pompey about 63 B.C. It is now in ruins. Its coins bear Gk. legends and inscriptions; from which fact it is probable that the wealthy classes were Gks. It was famous for its hot sulphur springs which still exist. The destruction of the Gadarene swine took place probably at Keresa on the E. shore of Galilee and not here.

Gaddi, It. family of artists:

Gaddo Gaddi (c. 1260-1332), painter, was b. at Florence. He was a friend of Cimabue, whose influence is seen in the 'Coronation of the Virgin with Saints and Angels,' a mosaic in the cathedral at Florence which is said to have been executed by him. Other works assigned to him are the mosaics in Santa Maria Maggiore, and those in the choir of old St. Peter's at Roine.

Taddeo Gaddi (1300-66), son of the former and a student of Giotto, was also b. at Florence. He painted in fresco the 'Virgin and Child between Four Prophets' in the Baroncelli Chapel in Santa Croce at Florence, as well as 'Scenes from the Life of the Virgin,' besides other frescoes at Pisa, Naples, and Berlin. His pictures are vigorous, but somewhat lacking in imagination.

Agnolo Gaddi (c. 1333-96), son of Taddeo, was b. at Florence and studied

under Giovanni da Milano and Jacopo del Casentino. His first work was probably the 'Resurrection of Lazarus' in the church of San Jacopo tra' Fosse at Florence. Other works of his are the frescoes at Prato, representing the two legends of the Virgin and the Sacred Grotto (these are still to be seen though much damaged), and the legend of the Cross, a work in the choir of Santa Croce, Florence, consisting of eight frescoes.

Gade, Niels Wilhelm (1817-90), Danish musician, was b. at Copenhagen. His *Erhoes of Ossian* (1841) first brought him before the public, the composition was well received, and the king gave him a stipend which enabled him to go to Leipzig. Here he became acquainted with Mendelssohn, and on his death became chief conductor of the Gewandhaus concerts. In 1818 he returned to Copenhagen and founded, some years later, with the composer J. P. E. Hartmann, the musical conservatorium. His compositions include orchestral music, e.g. his eight symphonies which are estimated his best work, cantatas, e.g. *The Erl-King's Daughter, Psychi, Spring Message, Spring Fantasy*, pieces for piano, and pieces for strings. He was probably one of the founders of the Dan. school of music. See Lives by W. Neumann, 1857, and W. Behrendt (*Minder om Gade*), 1930.

Gades, see CANIZ.

Gad-fly, see under HORSE-FLY.

Gadidae, family of fish called technically Malacopterygians, or bony fish. The cod-fish, or *Gadus*, is a member of this family. Others are the haddock and the whiting, both of which form valuable foods.

Gadolinium, metallic element of atomic number 64 and atomic weight 157.3. It belongs to the group of rare-earth metals, from which it may be isolated by the fractional crystallisation of their nitrates and bromates. Its salts are colourless and it forms a white oxide. Its symbol is Gd.

Gadsden, James (1788-1858), Amer. diplomatist, b. at Charleston, S. Carolina. He fought in the war of 1812, as also with Stonewall Jackson against the Seminole Indians. He afterwards became Amer. minister in Mexico and purchased by treaty in that capacity part of the states of Arizona and New Mexico. His diplomatic career was very successful.

Gadsden: 1. Co. in the N. of Florida, U.S.A.; pop. 30,000. 2. Tn. in Alabama, U.S.A., cap. of Etowah co. It is 60 m. N.E. of the tn. of Birmingham, and has cotton manufs., blast furnaces, and pipe works. Pop. 36,900. 3. VII. of S. Carolina, U.S.A. 4. VII. of Crockett co., Tennessee, U.S.A.

Gads Hill, short distance outside the tn. of Rochester. It forms the scene of the adventures of Falstaff and Prince Henry, as depicted in Shakespeare's *Henry IV*. It is of more recent interest as the residence of Charles Dickens. He had always coveted the house known as Gads Place, and purchased it in 1856. He lived here between 1860 and his death in 1870.

Gadwall, species of duck. It is practically unknown in Britain, although it

has been known to exist in the marshes of Norfolk. It is, however, found practically all over the world, existing in N. Africa, Asia, America, and in all parts of Europe. It is much esteemed as a table luxury, and is for that purpose imported in large quantities into Britain. In size it is not quite so large as the mallard, and it is a fresh-water bird. It breeds principally in marshy districts.

Gæa, or **Gæ** (Rom. *Tellus*), the earth-goddess. She was supposed to be the daughter of Chaos, and the mother of Uranus and Pontus (Earth and Sea). She is also said to have been the mother of the Titans and the Cyclopes. Her cult became extensive in the E., and she was worshipped originally at the oracles of Delphi and Olympia. She was also supposed to preside over Death, Hades, and Marriage.

Gækwar, **Guicowar**, **Garkwar**, or **Gæk-wär**, title of a powerful Mahratta prince, ruler of the state of Baroda in W. India. It was originally a family name, and is derived from the word meaning cow, though the family are not of low caste, but belong to the Mahrattas proper. The dynasty was founded in the first half of the eighteenth century by Damaji I., Pilaji, who gradually acquired authority over Gujarat, and Damaji II., who threw off his allegiance to the Poishwa. In 1948-49, the G. after a series of disputes with his State Congress party, agreed to the merging of Baroda in Bombay.

Gælic Language and Literature. Language.—The G. branch of the Celtic language may be said to be confined at the present day to some few thousand people in the Scottish Highlands, the W. of Ireland, the Isle of Man, Wales, and perhaps in parts of Cornwall. The language of the Scottish Highlanders is familiarly known among the Lowlanders as *Erc*, but the Highlanders themselves are never so named, nor is the name even known among them. They style themselves the *Gadel*, sometimes written and pronounced *Gael*, and their language, *Gædheig*, pronounced *Gæligh*, or nearly G. But the only name by which the Irish are, or were till recently, known to the Scottish Highlanders is *Gærl*. In contradistinction the Scottish Highlanders call themselves *Gael Alannich* or the *Gael of Albin*, and the Irish *Gael Erinrich* or the *Gael of Erin*. The Welsh call the Irish *Grydæci*, which is evidently the same as *Gadel* or *Gael*. It is a matter of topographical and, indeed, philological controversy exactly how the various branches of the Celtic family were disposed in Great Britain and Gaul in ant. times. It is sometimes assumed that the modern Gaels are a portion of the *Galli*, or *Gauls*, of the Romans, and the *Galatoe* of the Gks. But, if so, these names might be taken to be the same as the *Celtae* or *Keltai*, sometimes spoken of as a general name for the Gauls. This seems on historical grounds to be erroneous. The Gaels or *Goidels* of Great Britain and Ireland in Caesar's time were, with the Brythons (Britons), merely two Aryan races of the Celtic family, while the *Iverniens* or *Hebernians* (a word cognate

with *Erc* and *Erin*) were Turanian, which last fact makes it difficult to understand how *Erc* and G. came to become practically identified. It is probably largely a matter of mere names, and the identity of tongues is to be accounted for by the close intermingling of the races before the conquering *Goidels* drove the *Iverniens* into the W. of Ireland before they themselves were driven westward by the *Brythons*. All the G. or Celtic tongues as now spoken resemble each other closely in structure, though each has its distinctive features.

It is often asserted that G., even if once the universal language of the *Goidel* and *Brython* peoples of Early Britain, has left no trace in modern Eng., having disappeared with the reputed extermination of the Celts. The best authorities concur in seeing abundant traces. The very idiom 'I am speaking' is G., and is impossible of an exact rendering in any continental tongue, and the employment of the auxiliary 'do' as an intensifier is another common illustration of a distinctive G. idiom, and corresponds to the G. 'dean.' Whether or not G. is doomed to expire as a spoken language, nothing can destroy its imperishable influence on literature. So great an authority as Matthew Arnold declared that rhyme, the most striking characteristic of our modern poetry as distinguished from that of the ancients, is a direct legacy of the Celts, and in this opinion he is confirmed by Zenus, the most distinguished of Ger. Celtic scholars.

G. itself, or *Erc*, as spoken in the Highlands of Scotland and in Ireland at the present day, was one branch of the Celtic language, the other being Cymric or Welsh. The former was the common language of the greater part of England before Rom. invasion. It has been objected with much sound criticism that even at the Norman Conquest the great majority of the Eng. people were Celts, and that the stereotyped belief in the virtual extermination of the Britons, resting as it does on the sole authority of *Gildas*, as echoed by *Bede*, is really groundless. If this objection is accepted, many philological difficulties disappear, and it is probable that the etymologist Mackay is justified in assuming an unlimited blending of Celt and Saxon reflecting itself in the language, literature, and national character of the hybrid Eng. race. G. prevails largely in the colloquial speech of the Eng. people of to-day, and it underlies the Fr. and Sp. and some parts of the It. languages. The "Low Latin" of the Middle Ages, so beloved of law books, is a compound of G. (or other Celtic) words with Lat. terminations. Even the word *Angle* in the race-apellation A.-S. is a corruption of *An Gael*, or 'the Gael.' These and similar indications are the best possible refutation of Dr. Johnson's assumption that *Erc* was the rude speech of a barbarous people, who had few thoughts to express and that, such as it was, it was never a written language. The absence of much in the way of written records of G. is due largely to the ruthless destruction by piratical Danes and Norse-

men of all the records, monuments, and MSS. collected in the sacred isle of Iona. Irish records met with a better fate, but it seems that Dr. Johnson did not realise, in his strictures on Scottish G., that Irish and Scottish G. were essentially the same language, with but few more important orthographical differences than the substitution of a dot for the letter *h* in the mode of expressing the aspirate.

A curious survival of G. choruses and Druidical chants in G. is to be seen in the apparently meaningless words 'fäl, läl, la'; 'tooral, looral'; 'hey nonnie, nonnie, and 'down, down, derry down.' For example, the chorus in Morley's *Initation to May*, 1595:

'Now is the month of Maying
When merry lads are playing,
Fäl, la, la!
Each with his bonnie lass
Upon the greeny grass,
Fäl, la, la!'

The G. interpretation of these syllables is 'Welcome! the day!' (*Fäl* abbreviation *faille*, welcome, and *la*, a day).

Again, Shakespeare in many passages uses 'hey nonnie, nonnie,' which in G. signifies 'Hail to the noon.' For example, in *Much Ado about Nothing*, Belthazar sings the well-known lines:

'Sigh no more, ladies, sigh no more,
Men were deceivers ever,
and ends with

'Converting all your sounds of woo,
Into hey nonny, nonny.'

Writing.—The peculiar Ogham script (see OGHAM), used by the anct. Celts, was the only original 'national' script of the Celts. The modern Irish script is a development of the medieval Irish hand of the Lat. alphabet, which is considered by some scholars to have been introduced into Ireland from Gaul by St. Patrick (fifth century A.D.). In medieval times three varieties were employed: the *maiusculae*, mainly used for headings; the *semicircular*, mainly used for religious books; and the *minuscule* or angular script mainly used for lay books and documents. The Irish missionaries and monks carried their script into various countries of the Continent.

G. presents various peculiarities which cannot be expressed by the usual Rom. characters. For instance, some Irish consonants have two different pronunciations: the plosives *c*, *t*, *p*, *g*, *d*, *b* are sometimes aspirated and sometimes non-aspirated. Thus a dot placed on a consonant generally indicates that it should be aspirated. On the other hand, the acute accent placed on a vowel indicates that it should be pronounced long; besides, there are a great many vowel combinations, which generally have but a single sound. For instance, *ai* or *ea* represents the short sound *æ*, *de* or *ao* = long *æ*, *oi* = *œ*, *öi* or *öö* = long *o*, and so forth.

Apart from these dots, accents, and combinations of vowels, the Irish alphabet only consists of eighteen characters,

i.e. five vowels (*a*, *e*, *i*, *o*, *u*) and thirteen consonants (see figure on p. 266 of vol. I.). It may be pointed out that *c* represents the sound *k*, but also final *g* is pronounced like *k*; *s* before *e* and *i* is pronounced like *sh*. In comparison with the Eng. alphabet, the following letters are missing: *j*, *k*, *g*, *v*, *w*, *x*, *y*, *z*.

Literature.—The most anct. literary specimen relating to the Scottish Gaels is the *Book of the Deer*, or *Book of Deir*, which contains part of the gospel in St. Jerome's Lat. version in handwriting reputed to be of the ninth century. After the twelfth century there followed a long period of literary sterility in the Scottish G. language, the written language having almost entirely disappeared. Such MSS. as are preserved are in the Irish language. There is in the National Library, Edinburgh, the celebrated codex of verses (said to be the oldest extant Scottish G. verse), known as the *Dean of Lismore's Book*, compiled by Sir James Macgregor, the dean of Lismore. A number of books, mainly of a devotional character, were trans. into G. from time to time, for the use of Scottish Highlanders; but down to the eighteenth century the blank in Scottish G. literature is relieved only by a few MSS. like the *Red Book of Clanranald*, dealing with the hist. of the Scottish clans of Macdonald and Montrose, and the *Book of Fernaig*, a compilation of religious and political poems; and the collection of poems entitled Mackenzie's *Beauties of Gaelic Poetry*, 1904, chiefly remarkable for the ballads of the famous woman-bard, Mary MacLeod. The i puted first book actually printed in Scottish G., apart from the devotional books above noticed, was the G. vocabulary compiled by the Scottish poet Alexander Macdonald (commonly called Mac-Mhaighstir-Alastair). Incomparably the most popular work of the Scottish G. poets was that of Dugald Buchanan, the schoolmaster of Perthshire. The most notable of his hymns, which are collected in the *Iavidhibh Spioradail* (Spiritual Hymns), first pub. in 1767, are 'Latha a' Bheithearns' (The Day of Judgment), 'Am Bradar' (The Dream), 'An Clageann' (The Skull), and 'An Geanhradh' (The Winter).

Of far greater interest from a purely literary standpoint is James Macpherson's *Poems of Ossian*, the pub. of which led to a bitter controversy as to their authenticity, which culminated in an inquiry by the Highland Society and a considerable literature. The result of the controversy establishes that though the characters introduced by Macpherson were not fictitious in the sense that they were known to the traditions of the Highlands and that there were in existence ballads repeated orally among the Highlanders relating to the deeds of mythical heroes, yet Macpherson had pieced together into an apparent sequence the fragmentary nature of this raw material with compositions of his own containing sentiments familiar in classic epics like the *Iliad*.

Of later Highland poets Ewan Mac-lachlan's G. poems of nature and romance

contain many exquisite lines. The most noteworthy of them were pub. under the title of the *Melritical Effusions*. Peter Grant's sacred poems are as well known to every Highlander as those of Buchanan. Notable, too, in a lesser degree was the poetry of 'Rob Doon' (Robert Mackay). Among prose writers Norman Macleod's name is most noteworthy in G. literature. But apart from his name and that of other modern writers, in the decaying G. language there is but little prose, outside collections of folklore and proverbs, except religious books like Knox's *Liturgy*, Calvin's *Catechism*, and Kirko's version of the Celtic Bible, together with various dictionaries like Armstrong's *Gaelic Dictionary* (London), 1825, and the *Dictionarium Scoto-Celticum*, pub. by the Highland Society of Scotland in 2 vols. (London and Edinburgh), 1828.

The Irish G. language is infinitely richer in extant work than the Scottish, and indeed, as has been shown, inspired and set the style to most of what remains of the latter. Far from being confined to a little poetry, collections of folklore, and prose, conspicuous either by its absence or confined to trans. of religious works, Irish G. can show miscellaneous tracts like the *Book of Leinster*, a bibliotheca or collection of historical MSS., poems, tales, and genealogies (written by Finn, bishop of Kildare for Aedh MacCremhainn, tutor of Diarmait MacMurchadha, the celebrated king of Leinster); chronicles of wars like the fragments in the *Chronicles of Picts and Scots*, and the 'chronicles of wars of the Irish with the foreigners' like the *Cogadh Gúaidhel ne Galláibh* (authorship attributed to MacLing, the bard of King Brian); various compilations from auct. MSS. like the *Book of Ballymote*, the *Leabhar Breac*, or Speckled Book, the *Leabhar na-h-Midri* (Book of the Dun Cow) and the *Book of Fermoy*, all in the G. vernacular, containing a valuable miscellany of poems, tales, and legal matter; the celebrated 'Irish Law Tracts'; eccles. documents and Lives of saints; works on medicine; and an inspiring array of auct. Irish annals, notably those of Ulster and Connacht, besides trans. from foreign languages. For fuller information on the literature of the Irish, Welsh, Manx, Cornish, Breton, and other dialects, rooted in G., reference should be made to works on Celtic literature, especially as to Ireland, O'Reilly's chronological account of some 400 Irish writers down to 1750: *The Transactions of the Ossianic Society*, containing the tales of the Ossianic cycle; *The Miscellany of the Celtic Society*, 1849; *Chronicon Scotorum*, dealing with Irish affairs down to A.D. 1135; and *The Annals of Loch Clé*; as to Welsh, the *Myvyrion Archæology*; the *Four Ancient Books of Wales*, containing the Cymric ballads of the sixth century; the *Mabinogion*, a collection of romantic tales and myths (an excellent trans. of which, by T. and G. Jones is pub. in Everyman's Library), the most notable character in which is, perhaps, the bard Taliesin ('Radiant Brow').

The most striking of Irish G. poems are,

of course, the Ossianic, sev. of which appear to have been taken from a MS. of lays collected in 1626 in and about the glens of Antrim, and sent out to an Irish officer to while away the tedium of a campaign in the Low Countries. Ossian, or Oisín, was the last of the auct. pagan heroes, and in the many collections of poems traditionally ascribed to him, or to his father and chief, Flann MacCunnail, it is not always certain which of them are really authentic G. poetry. The Ossianic poems have survived by oral tradition, and do not exist in written form earlier than some 300 years ago. The worship of nature, which runs through most of them, and the rugged note of the fighting clansman are in curious contrast to the simple piety of religious poems like those of Conor O'Riordan. The prin. religious poem of auct. Ireland is the celebrated *Sallair na Ráinn*, or *Psaller of the Verses*, attributed to Oengas the Culdee of the ninth century. It contains 150 poems and is not inaptly regarded as the Irish *Paradise Lost* and *Paradise Regained*, dealing as it does with the Creation of the Universe, the Heavenly Kingdom, the Forbidden Fruit, the Fall and Expulsion from Paradise, the Penance of Adam and Eve, and the Death of Adam. The only complete existing copy of this poem is contained in the Bodleian MS., the text of which was pub. in 1883 by Dr. Whitley Stokes. Miss Eleanor Hull's is the first Eng. trans. and her work repays study if for no other reason than the curious Irish conception of the universe with its faint flavour of Lucretius, softened albeit by the mystic notion of eight winds fashioned in manifold hues. The purely pagan G. poems are strongly tinged with mysticism, and display in a marked degree the sort of conflict of an open and joyous temperament, weighing its material love for the songs of birds, the dancing song-time, and all the glories of brilliant nature against the advancing claims of Christianity to a wholehearted enthusiasm for the purely spiritual. Some of these poems are of unquestionably fine dramatic power, and reveal a subtle beauty of correspondence between the sentiments of the 'Keen' ('Keeners' are professional Irish singing mourners) and the imaginary scenic surroundings of the singer. Sev. are laments on untimely deaths, echoing a fatalistic acceptance of the fierce vindictiveness and jealousy of the G. character. The *Keen on Art O'Leary*, which originally appeared in Mrs. Morgan J. O'Connell's *The Last Colonel of the Irish Brigade* (1892), is a dirge of singularly moving pathos.

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Gaertnera, genus of Rubiaceae. It is common to the tropical dists. of Africa and Asia; some of the species are cultivated for their fragrant blossoms. Of these *G. racemosa* is one of the best known.

Gaeta, tn. and fortress of Campagna, Italy, situated some 70 m. N.W. of Naples on the gulf of G. It is the seat of an archbishop, and was the scene of the last stand of the reigning prince of Naples against united Italy (1861). In Roman times it was known as Portus Caeta. It is one of the best ports in Italy. G. fell to the allied Fifth Army in Oct. 1943. In the campaign the cathedral suffered considerable damage, but its fifty-seven Rom. columns, Gothic arch, and bell-tower survived. The church of San Cosmo at Elena was badly hit, and many churches sustained some damage. The Palazzo Caetani (or Gaetani) was partly demolished. Pop. (com.) 22,000.

Gætulia, name given in classical times to the region immediately S. of Numidia and Mauritania in N. Africa. The country was inhabited by a Libyan race who are probably the ancestors of the modern Berbers. They were conquered and made part of the empire by the Romans at the beginning of the Christian era.

Gage, Thomas (1721-87), Eng. general, son of the first Viscount G. Served in the Seven Years war, and, in 1755, in Brad-dock's ill-fated Amer. expedition. In 1760 he was appointed military governor in Montreal, and, in 1763, commander-in-chief of the Brit. forces in America. As governor of Massachusetts he precipitated the revolution by his ill-timed severity, and, after the battle of Bunker's Hill, he was recalled to England.

Gage, see GAUGE.

Gahanbar, name applied to the six annual Parsee festivals. Each of the festivals lasts for five days.

Gahnite, ore of zinc belonging to the class known as spinels. It varies in composition, and may contain several elements other than zinc. Part of the zinc may be replaced by iron or magnesium. The general formula may be given as $(\text{ZnFeMg})(\text{AlFe})_2\text{O}_4$.

Gaiety Theatre, London, opened in Dec. 1863 by John Hollingshead. The first productions were *On the Cards* by F. C.

Burnand and *Robert the Devil* by Gilbert. The new building, designed by the famous Eng. architect, Norman Shaw, was opened in 1903 with George Edwardes's *Orchid*. Among other early plays which appeared at this theatre were *The Spring Chicken*, *The New Aladdin*, *The Girls of Gottenburg*, and *Our Miss Gibbs*. The Gaiety is in the Strand, on the N. side, at the W. end of Aldwych.

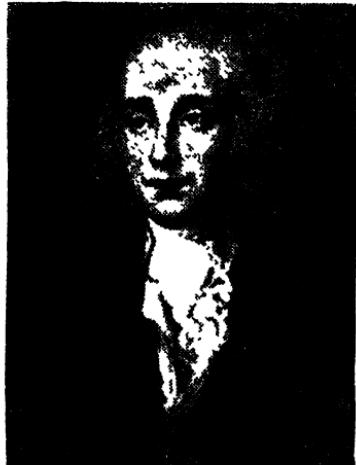
Gallia, Fr. tn., dept. of Tarn, situated on the R. Tarn, near Albi. The tn. was built round a great Benedictine monastery of the tenth century, and still has a great wine trade. Pop. 7000.

Gainesville: 1. City of Florida, U.S.A., and co. seat of Alachua co. It stands in the midst of a co. which yields cotton and fruit in abundance. There are phosphate and fertiliser industries, bottling works, etc.; market gardening is also carried on. It is a well-known winter resort. The E. Florida seminary is situated here. Pop. 13,700. 2. City of Texas, U.S.A., situated in Cooke co. It is a great industrial centre and manufs. cotton-seed oil, flour, and iron ware. Pop. 4600. 3. Tn. of Georgia, U.S.A., in Hall co. Is a mining centre, and has some cotton mills, and is a popular summer health resort, with mineral springs. Its chief manufs. are cotton-seed oil. It is the seat of the Brenau College. Pop. about 10,200.

Gainsborough, Thomas (1727-1788), Eng. portrait and landscape painter, b. at Sudbury in Suffolk, where he received small schooling, but where, by the age of ten, he had 'sketched every fine tree and picturesque col.ago.' At fourteen he went to London, studied etching under Gravelot and painting under Hayman. At nineteen he married a young lady with £200 a year, and started housekeeping in Ipswich, where he remained till he moved to Bath in 1759. His studio soon became a resort of wealth and fashion, and among his sitters at this period were Richardson and Sterne, the novelists, and Garrick, whom G. regarded as 'the greatest creature living.' Moreover, he patronised musicians of every nationality, himself tried to play the harp, haut boy, and viola-gamba, and was a welcome *habitué* at the green-room of Palmer's Theatre. In 1768 G. was chosen one of the thirty-six foundation members of the Royal Academy, and was a regular contributor at its exhibitions until 1784, when he virtually retired because in his opinion 'The King's Daughters' had been unfavourably hung. In 1774, at the height of his fame, he removed to London, where he paid £300 for his share of Schomberg House, Pall Mall. Here he painted a number of the great people of the day, among them Dr. Johnson, Clive, Franklin, Sheridan, Canning, Burke, Lady Mary Montagu, and Mrs. Siddons, whose portrait is still one of the treasures of the National Gallery. His death was due to a cancer which rapidly developed after a chill caught whilst attending the trial of Warren Hastings. At the last he was reconciled with Reynolds, his rival and former friend, who came to him on his deathbed and who was dismissed with the words: 'We

are all going to heaven, and van Dyck is of the company.'

It was Reynolds who generously and truly prophesied that, with the growth of an Eng. school, 'the name of Gainsborough will be transmitted to posterity as one of the very first of that rising name.' His contemporaries were almost unanimous in their preference for his landscapes, a judgment due largely, no doubt, to the pre-eminence of Reynolds in portraiture, but one nevertheless which most critics of to-day will endorse. In his earlier works he faithfully reproduced nature down to her smallest detail, but when he grew older his landscapes became, as Ruskin justly remarked, 'rather notices of feeling and colour than earnest studies.'



THOMAS GAINSBOROUGH

Self portrait.

Whilst Richard Wilson looked back to Claude for much of his inspiration, G. sought always, as in his 'Waggon and Horses Passing a Brook,' 'The Cottage Door,' and 'The Market Cart,' to give an individual and personal rendering of what he saw, anxious above all to present a harmonious picture of an artistic impression. His portraits, such as 'Orpin, the Parish Clerk' and 'Master Buttall (the Boy Blue),' although invariably graceful and often expressive to a high degree of a passing phase or gesture, have all the merits of instinctive genius without any of the laborious finish essential to the best work. His lightning speed might secure a good likeness, but the style was inevitably one of 'hatching and scumbling.' Yet such is the exquisite blend of shining draperies with backgrounds of soft cloud-girt skies and feathery trees of spraying, lightly touched foliage; such is the solemn grandeur produced by the glow and richness of his colours and the transparency

of his shadows, that even his least scholarly portraits are justly deemed masterpieces. See A. Cunningham, *Lives of the Painters*, 1829-33; lives by Lord R. Gower, 1903; J. Greig, 1909; W. T. Whitley, 1915; E. R. Dibdin, 1923; and Mary Woodall, 1949.

Gainsborough, m.rkt. tn., situated on the R. Trent, Lincolnshire, England, about 15 m. N.W. of Lincoln. Its chief industries are shipbuilding, engineering, and the manuf. of agric. implements, also oil, linseed cake, malt, and cordage. A tumulus here is supposed to be the tomb of King Sweyn. The tn. has a very fine bridge and a manor house, said to have been founded by John of Gaunt. Pop. 17,900.

Gairdner, James (1828-1912), Eng. historian, b. at Edinburgh. He entered the Public Record Office when boy, and afterwards became assistant keeper. He ed. a considerable number of historical works, and contributed much to modern historical literature. His accuracy has seldom been at fault, and he proved himself a man of unprejudiced judgment. Among the works which G. ed. are *Memorials of King Henry the Seventh* (1858); *Letters and Papers of the Reigns of Richard III. and Henry VII.* (1861); *The Paston Papers* (1872-75); and *Letters and Papers of the Reign of Henry VIII.* (1880-1910). His other works include *Richard III.* (1878); *Studies in English History* (with James Spedding) (1881); *A History of the English Church* (1902); and *Lollardy and the Reformation in England* (1908).

Gairloch, Scottish vil., 30 m. N.E. of Portree in Skye. The vil. is the centre of large cod fisheries. It is mentioned in *My Schools and Schoolmasters* (1854), autobiography of the geologist, Hugh Miller. Pop. 3000.

Gaisin, tn. of the Ukraine in the region of Kamenets-Podolsk. Pop. 11,000.

Gaius, or Caius, Rom. jurist and one of the five great luminaries of Rom. jurisprudence, the others being Papinian, Paul, Ulpian, and Modestinus. Probably b. in the time of Hadrian, and flourished during the second Christian century, writing under the Antonines. Nothing is known of his personal hist., although he himself tells us that he was an adherent of the school of Sabinus. He composed, besides other works he is known or believed to have written, a treatise on the *edictum provinciale*—i.e. the edict of the proconsul in the provs.—and a commentary on the *Twelve Tables* (q.v.). But the work by which he is known to all law students is his *Institutes*, and the discovery of the Ms. of this work by Niebuhr in 1816 has very greatly contributed to our modern knowledge of Rom. law. The Ms. had been written over with the letters of St. Jerome, and its very existence was all but unsuspected until Niebuhr found it while examining the contents of the library of the chapter at Verona. The work formed the basis of the Institutes of Justinian (q.v.), who has followed the order in which G. treats his subject, and adopted his exposition of law, so far as it

was applicable to the times in which Justinian's Institutes were composed. The work of G. affords a valuable comparative study, showing where the law changed between the two periods, and so enables us to understand what the law had really been at the time when its system was most perfect. The best ed. of G. is that of Postic. Other eds. are those of Kruger and Studeinund (4th ed., 1900); E. Duvols; and Abby and Walker (1885).

Galactometer, see LACTOMETER.

Galactose (formula $C_{6}H_{12}O_6$), one of the hexose sugars, isomeric with glucose (grape sugar) and fructose (levulose or fruit sugar). G. exists in three forms, viz. inactive, dextro-, and laevio-rotatory. The dextro-modification is obtained, together with glucose, by the hydrolysis of milk-sugar. On reduction it yields the alcohol dulcite, and on oxidation first galactonic acid and finally mucic acid. Melting point 166°. Potassium hydroxide converts d-G. into a mixture of d-tagatose and β -tagatose.

Galago, see GALATZ.

Galago, name of a genus of Lemuridae found in Africa. The species are small, carnivorous animals with long bushy tails. *G. crassicaudatus*, of the W. coast, the largest species, is about the size of a cat; *G. senegalensis*, common in equatorial Africa, inhabits the mimosa forests.

Galahad, in the Arthurian romances the son of Lancelot and Elaine. In the cycle of legend he is the model of ideal knighthood and purity. He sets out on the quest of the Holy Grail, and on his journey redresses all grievances that cross his path.

Galanga, or **Galangal** (Chinese *Kao*, name of a prov., *liang*, mild, and *kiang*, ginger), name given to *Alpinia*, a genus of plants belonging to the Zingiberaceæ; it contains many species, the most important being *Alpinia officinarum*, a native of S. China. The roots and stems of this plant possess aromatic, stimulating properties similar to those of ginger, and are largely used in E. pharmacy.

Galapagos (Sp. tortoise) Islands (officially renamed the Colon Archipelago in 1892), group of volcanic ls. in the Pacific near the equator, W. of Ecuador, to which they were annexed in 1832. The chief ls. include Albemarle (largest), James, Charles (on which is a penal settlement), Chatham, and Indefatigable. The group was discovered by the Spaniards in the sixteenth century. They were once noted for tortoises of enormous size (*Testudo elephantopus*), which are now far less numerous. Large turtles abound, and there are remarkable peculiarities in the fauna and flora. Products: Guano, sulphur, sugar, and archil (purple dye from lichen). Darwin explored the ls. The total area is about 2950 sq. m. Pop. about 1000. See C. Darwin, *Journal of Researches into the Natural History and Geology of the Countries visited during the Voyage of H.M.S. 'Beagle'*, 1839; A. Wallace, *Geographical Distribution of Animals*, 1878; —, *Wolf, Ein Beech den G. Inseln*, 1879; and W. Beebe, *Galapagos: World's End*, 1924.

Galashiels, parl. bor. and tn. in Selkirkshire, Scotland, situated about 4 m. N.W. of Melrose and Gala Water. The chief industry of the tn. is the manuf. of Scotch tweeds, and to this industry the prosperity of the tn. is due. The residence of Sir Walter Scott, Abbotsford, is just outside the tn. Pop. 13,300.

Galata, suburb of Istanbul, situated at the S. end of the Bosphorus. Here are found principally the banking houses and shipping agencies. There is also a lighthouse.

Galatea: 1. Sea-nymph, daughter of Nereus and Doris, *see ACTS*. 2. Name given to an ivory statue endowed with life by Venus at the prayer of the sculptor Pygmalion (*q.v.*).

Galatia: 1. Anct. dist. of Asia Minor. The name is derived from the Galato who invaded and settled in that part of the peninsula about the third century B.C. It was included in the Rom. Empire and under Augustus became a Rom. prov. The tns. of Antioch, Derbe, and Lystra, all of which were visited by St. Paul, are in this dist. 2. VII. of Saline co., Illinois, U.S.A., near Eldorado. Pop. 1000.

Galatians, St. Paul's Epistle to the, one of the four epistles undoubtedly written by St. Paul, and forming part of the N.T. Marcion's canon contains the first allusion to it, but by the second century it was widely read and appreciated. It was probably composed at Ephesus about A.D. 50, although some critics believe it was dispatched from Achala or Macedonia during the winter or spring of A.D. 57-58, and an attempt has been made to date it to the Council of Jerusalem. The epistle was addressed, it seems, to the inhab. of that part of Galatia which bordered on Bithynia and the prov. of Asia. They were mostly of pagan birth. In the main Celts, though there were Thracian aborigines and Rom. and Gk. immigrants besides. During his missionary journeys, St. Paul had founded and revisited the churches of Galatia. The epistle, which 'reads like a dithyramb from beginning to end,' was a passionate outburst, containing, strangely enough, no word of praise, greetings, nor messages against the 'lapsed,' who had been won over to circumcision and countless other formal observances by certain Judaizing enemies of St. Paul. Briefly speaking, the letter is divided into a vindication of his mission and apostolic independence, an inspired exposition of how Christianity had superseded the Mosaic law, a panegyric of faith as the mark of the true 'son of Abraham,' and finally a fervid plea for the superiority of Christianity to legalism as the 'free and final religion.' The whole style of the epistle, which has been described as 'a veritable torrent of genuine and inimitable Paulinism'—and especially the spontaneous but jerky thought development with its hurried sentences and abrupt pauses—is in very strong contrast to the calm and measured exposition of the later Epistle to the Romans, which deals with the same issue; but it is inferred from the Epistle to the Romans, as well as from

1. Corinthians, also written after the Epistle to the Galatians, that the Christians in Galatia had then been won back to St. Paul and his gospel. The Epistle to the Galatians is something more than a writing dealing with a controversy of bygone days; it is for all time the charter of Christian freedom 'not only from the Mosaic law, but from every yoke that is imposed upon the religious life as an external condition of salvation without reference to any inner necessity of the soul.' The Epistle to the Galatians furnished Luther with his weapons in the battle for freedom at the Reformation. Earlier commentaries by Luther, Calvin and Beza, Eng. commentaries by Ellicott (1851), Jowett (1855), Alford (1857), and Lightfoot (1865, 1874).

Galatz (Rumanian Galăti), tn. in Rumania, important as a port and as the seat of a bishop. It is situated on the l. b. of the Danube. It is the seat of the Rumanian III. Army Corps and the naval school, the International Danubian Commission and the chief Danube shipping companies, and three chambers of commerce. It is an important industrial tn. and among its chief industries are the manufs. of candles, soap, wire, nails, buttons, chemical products, iron, and copper. It possesses saw-mills, paste-mills, flour-mills, roperies, and petroleum refineries. It is the chief port of entry for the oversea trade of the Danube and the chief port for the export of timber. Other exports are maize, wheat, barley, rye, and flour. The rapid growth of the tn. is due to the opening up of the Danube carrying trade. It has been the scene of two engagements between Turks and Russians. In the Second World War it was captured by the Russians on Aug. 27, 1944 (see further under EASTERN FRONT, OR RUSSO-GERMAN CAMPAIGNS IN SECOND WORLD WAR). Pop. 101,000.

Galaxy, or Milky Way (from Gk. γαλαξία, *galaktos*, milk), name of a splendid luminous belt of innumerable stars, which may be seen, on a clear night, stretching in a great arc from horizon to horizon. It surrounds the whole earth in what is almost a great circle, and is inclined to the equinoctial at an angle of 63°. For some 150° the zone spreads out into two branches—one shining, the other dull and disconnected—which eventually reunite. To the naked eye the stars are merged together in one broad stream of light.

Galba, Servius Sulpicius (3 B.C. to A.D. 69), Rom. emperor, became consul in A.D. 33, and under Nero showed courage, force, and equity in the administration of Aquitania, Africa, and Hispania Tarraconensis. With the help of Vindex, Otho, and the pretorian guard, he became emperor instead of Nero in A.D. 68. But no sooner was he fully instated than he lost all his popularity and became a laughing-stock for his extreme avarice, the extortions of his favourites, to whom he surrendered the reins of power, and his refusal to pay the soldiers the promised rewards. In A.D. 69 Otho led a successful mutiny and became emperor in his place. G. was assassinated by Otho's legionaries.

Galbanum, gum-resin obtained from *Ferula galbaniflua* and *F. rubricaulis*, two species of Umbelliferae. It can be used medicinally as an antispasmodic expectorant, and external rubefient, but is inferior in power to asafoetida obtained from an allied species.

Galdós, Benito Perez (1842-1920), Sp. novelist and, in his time, Spain's foremost man of letters. B. at Las Palmas, Canary Is. He was educated at Madrid, and when twenty years of age he returned to Madrid and worked for seven years as a journalist, afterwards devoting himself to writing novels until a few years before his death, when he became blind. G. was a most prolific writer, and his great collection of works comprises early novels, two series of Sp. national historical episodes, contemporary Sp. novels, new Sp. historical episodes, comprising three series of fifteen works, dramas, and miscellaneous works. He first made a name with his historical novel *La Fontana de Oro*, and many of his books have been trans. into Eng., amongst these being *The Perfect Lady*, *Trafalgar*, *Leon Roch*, and *Marianela*. Since the time of Cervantes, G. was the writer who most influenced the Sp. mind. For nearly a quarter of a century he was a member of the Royal Academy of the Sp. Tongue, but he more than once refused official honours owing to his excessive modesty. He sat in Parliament on sov. occasions as a Republican member. The honour in which he was held was shown at his funeral, there being an attendance of members of all the academies, members of the gov., the whole of the Madrid tn. council and prov. deputies; while the official *Gazette* announced a decree of the gov. offering to pay all the expenses of the funeral of 'Spain's greatest writer since Cervantes.' Many of his theatrical works have been played both in Spain and in other countries, the best known being *Gloria* and *Electra*. See L. B. Walton, *Perez, Galdós and the Spanish Novel of the Nineteenth Century*, 1927.

Gale, see STORM.

Gale, Sweet, see BOG MYRTLE.

Gale, Thomas (c. 1638-1702), Eng. antiquary. Became prof. of Gk. at Cambridge in 1666 and fellow in 1669. Dean of York, 1697. Noted for his eds. of classical writers and works on early Eng. hist.

Galen, or Galenus, Claudius (c. A.D. 130-201), Gk. physician, b. at Pergamos in Mysia, Asia Minor. He studied medicine here, and later travelled to the tns. of Corinth and Alexandria in order still further to continue his studies. He went to Rome, where he spent some years in study, afterwards being made physician to the Emperor M. Aurelius. He also attended the emperors Commodus and Severus. He is supposed to have d. in Sicily. He gained a great reputation in all branches of medical science, and was a great writer on this subject. His discourses, and his commentaries on Hippocrates, are very learned and show great medical knowledge; they prove beyond doubt that he was a practical as well as

a theoretical scientist. For many years they formed the basis of the world's medical knowledge. Many of the works attributed to him are, if not spurious, at any rate so doubtful that we cannot recognise them as his. There are, however, about eighty treatises which are beyond doubt genuine.

Galen, Clemens August, Count von (1878-1946), Ger. prelate b. at Dinklage of an anc. noble family. In 1933 he became bishop of Münster, and as a leader of the Rom. Catholic Church, like Cardinal von Faulhaber and Cardinal Count von Preysing, was an outspoken critic of National Socialism, especially during the Second World War. He was elected cardinal in March 1936, but d. of exhaustion soon after his return from Rome in the same month.

Galena: 1. City of Illinois, U.S.A., cap. of Jo Daviess co. It is the centre of a lead-mining industry and has foundries, machine-shops, and flour-mills. Chief manuf.s are shoes, furniture, lumber, etc. It was the home of President Grant and it has a Ger.-Eng. College and the St. Clement Academy. Pop. about 5000. 2. City of Kansas, U.S.A., in Cherokee co., an important cent. of the lead and zinc industries, and there are large smelting and stamping works. It is the seat of Spring River Academy. Pop. 5000.

Galena, or Lead-glance, the naturally occurring sulphide of lead (PbS) which constitutes the chief source of the metal. G. is found widely distributed in the form of cubic crystals of a lead-grey colour (sp. gr. 7.5; hardness, 2.5), occurring chiefly in veins in the carboniferous deposits, and often accompanying other metallic ores. G. is easily oxidised, and the metal is readily obtained by reduction. Some specimens contain so much silver that the separation of that metal is profitably carried on. See LEAD.

Galeopithecus, name given to the single genus of the Galeopithecidae, a family of Insectivora which is sometimes included among the bats or the lemurs. They inhabit the forests of Malaya and the Philippines Is., flying from tree to tree by means of the patagium, or parachute-like membrane; when at rest they hang by their posterior limbs, head downwards, after the manner of bats. They are about the size of cats and are nocturnal animals. There are only two species, *G. rothschildi* and *G. philippinus*.

Galerius (Galerius Valerius Maximianus), Rom. emperor, b. in Dacia, of humble parentage. Rose from a common soldier to be the son-in-law of Diocletian, who, in 292, made him Caesar over Illyricum and the Danubian region. On the abdication of Diocletian in 305, G. became emperor of the E. Empire, which he ruled till his death in 311. His name is associated with the cruel persecutions of the Christians under Diocletian.

Galesburg (named after a famous Presbyterian preacher, George Gale), the co. tn. of Knox co., in the N.W. of Illinois, U.S.A. It is on the Atchison, Topeka, and Santa Fé, and also the Chicago, Burlington, and Quincy railways, the

latter having important steam-car factories here. Machinery and vitrified bricks are also manufactured. Other manuf.s are brooms, wagons, and corn-planter. Knox College, founded in 1837, and Lombard College, chartered in 1851, are important educational establs., also the Ryder Divinity School and St. Joseph's Academy. Pop. 28,800.

Galbaeus, Caledonian chieftain who headed the desperate resistance offered about 85 B.C. to the Rom. invaders under Gn. Julius Agricola. He was finally defeated at the battle of the Grampians.

Galiani, Ferdinando (1728-87), an It. political economist, pub. in 1750 his *Della Moneta*, a revolutionary description of coin or currency. For he maintained that money, being a merchandise, must not be restricted, either as regards interest or value, a doctrine at once adopted into the practice of his native city Naples. In the later ed. of 1780 he enlarged on the intrinsic value of the precious metals, and on their suitability as media of exchange. See A. Marighieri, *L'Abbate Galiani*, 1878.

Galicia, now a captaincy-general, and formerly a kingdom founded in the fifth century by the Suevi, occupies the N.W. corner of Spain. It is covered by ridges of the Cantabrian Pyrenees, the highest peak (6593 ft.) occurring in the Peña Trevinca. The Miño, rising near Mondedero, with its great affluent, the Sil, which rises between Leon and Asturias, is the chief riv. (170 m. long). The deep florids along the indented coast afford splendid anchorage, the chief harbours being Ribadeo, Ferrol, Corunna, Corcubion, and Carril. Both the mineral and agric. resources are, as yet, poorly developed, but cattle and swine (which feed on the abundant chestnuts) are reared for export. G. (11,254 sq. m.), which is the dampest part of Spain, has also the densest pop. (2,596,500).

Galicia, part of S.E. Poland and the Ukraine. Before the First World War the largest prov. (30,307 sq. m.), and a crownland of Austria, being then bounded to the N. and E. by Russia, to the S. by Bukovina and Hungary, and westward by Austrian Moravia and Silesia. An arc of the Carpathians, whose highest summits in this prov. are Wolowice (6713 ft.) and Czarna góra (6505 ft.), forms a S. boundary, and from its ridges both the Dunester and Pruth take their source within G. The Vistula, which becomes navigable below Cracow, flows in the prov. on the N.W. The climate is very severe; the winters are long and the summers short. The region is largely forested but there are extensive tracts of pasture land. The soil is fertile, and wheat, rye, barley, oats, and maize yield good crops, also hemp, flax, and tobacco. Potatoes are grown in large quantities. Horned cattle and horses are bred, also sheep, goats, swine, etc. Salt, petroleum, and coal are the most valuable minerals, the first being mined at Wieliczka, Bochnia, Kalusz, and Dolina, etc.; the second at Boryslaw, Sloboda-Rungurska (near Kolomea), and Polanka, etc.; and the third in the dist. of Cracow. Other

minerals are marble, alabaster, copper, calamine, and iron. Manufactures are backward, but textile goods are made in Bielsko, and distilling is important. The chief exports are salt, petroleum, cattle, hides, wool, coal, linen, aniseed, and brandy. Lvov (Lwów, Lemberg) (pop. 160 000) is the largest city, and Cracow (90 000), Przemysl, Kolomea, Tarnopol, and Stanislavov all have over 25 000 inhabitants. Educational establishments are numerous, the chief among them being the universities of Lvov and Cracow. G. was a crownland of Austria between the years 1772 and 1918. In the First World War both Poles and Ukrainians claimed her and fighting occurred until in 1919 the supreme council assigned W. G. to Poland and E. G. the right of self-determination. In Dec. of that year it was announced that E. G. should be granted autonomy under a Polish protectorate for twenty-five years, the future then to be decided by the League of Nations. In March 1923 the Council of Ambassadors recognised L. G. as a part of Poland. After the defeat of Poland by Germany in 1919 which resulted in the fourth partition of the country between Germany and Russia, G. was occupied by the Russians. In the German attack on Russia launched in 1941 the Germans overran the Russian occupied portion of Poland. In July 1944 the Russians took Lvov, Stanislavov, Przemysl, and other centres of G. Cracow fell to them on Jan. 14–19, 1945. (For details of military operations see EASTERN FRONT or RUSSO-GERMAN CAMPAIGN IN SECOND WORLD WAR.) The prov. of Lvov was incorporated after the war as a region of the Ukrainian SSR. Pop. over 8,500,000.

Galicia, Campaign in (First World War) In the early months of the First World War the Russians attempted to break through to Germany via Bohemia which necessitated an advance through G. In Sept. 1914 they swept over Tarnopol, Lemberg, and Przemysl, but were arrested at the Carpathian Mts. which were strongly held by an Austro-Hungarian force which offered the stouthearted resistance. In the spring of 1915 the Germans, under von Mackensen, broke through the important Gorlice line and soon hurled the Russians back. Mackensen relieved Przemysl at the commencement of June and Lemberg towards the end of the month. Brusilov (q.v.) commanded the Russians on this front and as soon as he reorganised his force dealt the Austrians a severe blow S.E. of Lemberg in Oct. 1915. He made another attack in the autumn of 1916 but the Russian Revolution brought all operations to a standstill. See also WAR, FIRST WORLD, Eastern Front.

Galignani, John Anthony (1796–1873) and William (1798–1882) were two publishers in Paris. They continued to bring out the daily newspaper (written in Eng.) entitled *Galignani's Messenger*, which their father had founded in 1814. In its columns they did what they could to establish cordial relations between England and France. Their connection with the paper was severed in 1884. A monument to their honour stands in Corbeil,

where they built and endowed a hospital.

Gallileans, fanatical sect, followers of a certain Judas of Galilee, who fiercely resisted taxation by the Romans, and whose violence led the latter to vow to exterminate them (see ACTS v. 37).

Galilee (from Heb. *Gali*, a border or ring), is rarely mentioned in the O.T. but some time after the return of the Jews from exile was surrendered by the Assyrians to the Israelites, and rapidly developed a vigorous nationalism so that



IN 4

TIBERIAS ON THE SEA OF GALILEE

when Palestine came under the Romans G. became a tetrarchate under the Herods. In the time of Jesus Christ the prov. spread from the Mediterranean to the Jordan thus embracing all N. Palestine. Upper G. was mountainous and well wooded whilst Lower G. was wonderfully fertile and flat. The prov. now forms part of Palestine being divided into Upper and Lower G. In the time of Christ the chief cities were Sepphoris and Tiberias, though other places such as Capernaum, Nazareth and Nain are much more important in the gospels story. The inhabitants were chiefly Syrians, i.e. mixture of Arabs, Greeks and some Jews whereas the population to day consists of Muslims, Jews, Christians, Arabs, Druses and Maronites but many Arabs, following the Jewish invasion of 1948 fled to neighbouring Arab countries. The sea of G., called also the lake of Gennesaret (sea of Tiberias and the sea of Ginneroth) is an expansion of the Jordan, 660 ft below sea level, 13 m long and 8 m broad. When Christ preached it was surrounded by smiling and happy vills of which Remond draws a beautiful picture as indeed of the whole country, in his *Life of Jesus*, but whereas this part of G. was once densely populated, it was until very recent years almost a wilderness and even fertility seemed to have deserted its shores. The people of G., despite the fact that in Judea they were regarded as boorish

provincials, whose Judaism was overlaid with despicable laxity and corruption, were attractive for their very simplicity and happy, gentle dispositions.

The vegetation of Lake G. (or the sea of Tiberias) is sub-tropical. Lower G. has a less intensive agriculture than the plain of Esdralon but resembles it in having 50 per cent of its ordinary crops, in the non-irrigated land, under cereals, and has proportionately less tubers, hay, and fruit, but more legumes. Its distinctive feature is its large area of olives and of fallow land. Upper G., on the other hand, has more of the intensiveness of the plains and more irrigated land, producing more deciduous fruit, especially grapes and apples, and more vegetables and green fodder. There are facilities for the repair of agricultural machinery at the Iton settlement in G. Kerschenich, beans and lentils are grown in Nazareth; chick-peas in Tiberias. Shortly after the First World War two small hydro-electric plants were founded at Nazareth and at Tiberias. The Nazareth station went out of business after a short time; the Tiberias station was taken over by the Palestine Electric Corporation in 1925, in which year a new 102-kW. station was built at Tiberias. During the Second World War Tiberias had a lake airport for flying boats. There are no springs at Tiberias, and parks, a feature of the development of the tourist trade in recent years by Jewish immigration. Of all the centres of the developing tourist trade the biggest development is foreseen in G. from Tiberias, to the waterfalls of Metullah (as well as in the coastal plain). Nazareth, a purely Arab tn. until recently, is distinctive in Palestine in having stone buildings. It retains something of the period of the crusaders, with its Franciscan monks and their old gardens and women clad in costumes embroidered in the style of the twelfth century carrying earthen jars on their heads. Amidst the hills of G. are hotels and sanatoria in the Jewish settlements, which offer hospitality to the visitor.

Galilee, architectural term for a porch or chapel attached to a church, examples of which may still be seen at the W. end of the navee in Ely and Durham cathedrals, and on the W. side of the S. transept in the cathedral of Lincoln. They were used sometimes as the part reserved for penitents, sometimes for corpses previous to interment, and at other times as the meeting ground for monks and their women relatives, who might not penetrate further into an abbey church.

Galileo Galilei (1564-1612), It. experimental philosopher and astronomer, a native of Pisa, and who, in 1581, entered the univ. there. At first he studied medicine, but early renounced this science in favour of experimental philosophy, finding a good friend in Guido Ubaldi, through whose good offices G. eventually obtained, in 1589, a mathematical lectureship in Pisa under the Grand Duke Ferdinand I. de' Medici. Having watched the swing of a bronze lamp in the Pisan cathedral, G. soon discovered the

isochronism of pendulum oscillations; for he found that the range of the swing or oscillation had no effect on its duration. He tested his discovery by counting the beats of his pulse and comparing the number of pulsations with the time of the pendulum vibration, and at once saw the possibility of utilising his invention for chronometers. In his youth he also wrote a treatise on the sp. gr. of solid bodies and constructed a hydrostatic balance. His next vital discovery was the equality of the velocities of all falling bodies great and small. Up to his time people had imagined that a body six times as heavy as another would fall through the same space in one-sixth the time, and although G. gave a practical demonstration of his principle from the Leaning Tower of Pisa, many among his audience continued unbelievers. In 1592 G. accepted the chair of mathematics in Padua, as his revolutionary discoveries and still more his biting satire had made him many active enemies in Pisa. Here he worked till 1610, and among his numerous inventions were an imperfect species of thermometer, a proportional compass, and the all-important refracting telescope. The Dutch claim that Jansen made the first instrument of this kind, but at least G. was a pioneer in employing it for astronomical investigations. With his new appliance he revealed a series of startling and brilliant scientific facts. Never before his time had any one declared that the Milky Way was, as Milton, who had visited G., stated, 'powdered with stars,' or that the moon, far from being a smooth and self-luminous sphere, was diversified with great mts. and valleys, and lightened only by reflections of the sun's rays from the earth, or that the planet Jupiter had four satellites, or that Saturn had a triple aspect (due to her rings), or, finally, that the sun which the schoolmen had regarded as a symbol of perfection was, in reality, besmirched with spots. It is not generally appreciated by modern scientific thinkers what little prominence time had in pre-Galilean systems of philosophy. It was taken for granted as being practically identical with consciousness itself, thus calling for no special thought on its own account. The great achievement of G. was to create conceptions in terms of which motion could be treated mathematically, and to this end he represented time as a space-like dimension which could be measured—divided up into equal parts as a length is. But this dimension, or 'spacified' extension, of time was so conceived for the one purpose of making motion amenable to mathematical treatment. The world describable in terms of it was specifically limited by G. to the world of mechanical phenomena. All else—even physical experiences like heat, sounds, smells, colours, and the rest—he excluded from this world, and located in the perceiving being. It is difficult to overestimate the value of this achievement, for it has made possible the whole of modern physical science; and it is difficult also to overestimate the illusion it has created, for, having seen the

value of the concept of 'spacified' time in mechanics, subsequent thinkers, less perspicacious than G., have taken it to be a universal receptacle for the whole of human experience, and therefore as representing in a more precise form everything that human consciousness has ever meant by time. Consequently the whole of experience has been distorted to fit a concept to which most of it is non-conformable (Herbert Dingle).

After 1610 he worked freely in Florence under his new patron, Ferdinand II., to whom he dedicated, in 1632, his famous *Dialogue on the Ptolemaic and Copernican Systems*. Not content with showing that the latter adequately explained celestial movements, G. threw himself into theological controversy by trying to explain the congruity or incongruity of certain biblical texts read in the light of his theory. His interpretations ran counter



GALILEO GALILEI

Engraving from a picture by Allan Ramsay in Trinity College, Cambridge

to the accepted opinion, and already in 1616, though not condemned by name, he had been compelled by the Rom. Inquisition not to assert 'what seemed to contradict Scripture.' His 1634 pub. therefore was taken by the Rom. authorities under his former patron Urban VIII. as a direct challenge. He was summoned to Rome, where he was obliged solemnly to abjure his 'heresies,' above all that of the diurnal and yearly motion of the earth and of the stability of the sun. It was further to recite the seven Penitential Psalms once a week and was technically imprisoned, i.e. under observation, for the rest of his life. The remarks said to have been made to a friend—*Eppur si muove!* ('It moves for all that')—is apocryphal. Irascible, but forgiving by nature, G. loved the amenities of social life and was

qualified by taste and knowledge to pass judgments in poetry, music, and painting. Torricelli, who was passionately attached to his master, is the most famous of his pupils. See F. R. Wegg-Prosser, *Galileo and his Judges*, 1889; and J. Fabie, *Scientific Works of Galileo*, 1921.

Galileo's Telescope, see OPERA GLASS.

Galitzin, or Gallitzin, famous and powerful Russian family whose members have distinguished themselves alike in war and diplomacy from the sixteenth century onwards. The following were among the best known:

Vasili Yasiljevitch Galitzin (1643–1714), surnamed the Great, regent during the minority of Peter the Great.

Dimitri Alexejevitch Galitzin (1735–1803), Russian ambassador in Holland and France, and the intimate friend of Voltaire and Diderot.

Dimitri Augustine Galitzin (1770–1841), son of the preceding, was b. at The Hague. He was for some time vicar-general of the diocese of Philadelphia. Severely simple in his own mode of life, he was prodigal of help and sympathy to those around him, by whom he was universally known as Father Smith.

Nikolai Sergievitch Galitzin (1808–92), historian and lieutenant-general in the Russian Army. His chief work is a hist. of war (Ger. trans., *Kriegsgeschichte seit den ältesten Zeiten* (13 vols.), 1874–89).

Gallium, genus of Rubiaceæ, consists of over 200 species, ten of which occur in Britain. They are herbaceous plants with whorls of leaves, and are visited by insects for the sake of the honey they secrete. *G. cruciatum*, the cross-wort, is a native of Europe, and is commonly found in Great Britain; *G. verum*, the ladies'-bedstraw or cheese-reinnet, is found in dry soils and serves several useful purposes; *G. aparine*, the common goose-grass or cleavers, is a native of Europe, N. Asia, and N. America. The term bedstraw applied to many of the species is obtained probably from the old custom of strewing beds with fragrant herbs.

Gall, St., 'the apostle of the Alemanni,' Irish saint and pupil of St. Columba, whom he accompanied to Gaul about 585. After much missionary work he retired to the forest of Steinach, near Lake Constance, and founded the famous monastery of St. G. The Swiss canton and tn. are also named after him.

Gall, Franz Joseph (c. 1757–1828), founder of the system of phrenology, was b. at Tiefenbronn, near Pforzheim in Baden, Germany. He became physician in Vienna in 1785. Having studied exhaustively from boyhood the external manifestations on the cranium of the different powers of human mind and character, he began a series of phrenological lectures in Vienna, 1796. Chief works (in collaboration with Spurzheim) were *Introduction au cours de physiologie du cerveau* (1808); *Recherches sur le système nerveux* (1809); and the first two vols. of *Anatomie et physiologie du système nerveux* (4 vols.) (1810–19). See life by Jessie Fowler, 1896; and Dr. B. Hollander, *In Search of the Soul*, 1920.

Gall, see BILE; GALL BLADDER.

Gallait, Louis (1810-87), Belgian painter, was b. at Tournai, where he studied art and painted his picture of 'Christ Healing the Blind Man' now in Tournai cathedral. He afterwards went to Paris to study art, where he also painted a number of pictures. Among his works are 'The Abdication of Charles V.'; 'Alva looking at the Bodies of Egmont and Horn'; 'The Last Moments of Egmont'; and 'The Plague of Tournai.'

Galland, Antoine (1649-1715), Fr. archeologist and orientalist, b. at Rollot. In 1701 he became a member of the Académie des Inscriptions, and in 1709 prof. of Arabic in the Collège de France. His chief work is his trans. of the *Arabian Nights*, being the first trans. into a European language. He wrote also *Les Paroles remarquables, les bons mots et les maximes des orientaux* (1694).

Gallarate, tn. situated in the prov. of Milan, Lombardy, Italy. It lies to the N.W. of Milan, and is engaged in cotton manuf. Pop. 22,000.

Gallas, Matthias von, Count of Campo, Duke of Lucera (1581-1617), Austrian general, distinguished in the Thirty Years war. He first served w/ the Spaniards in Savoy (1617), then with the army of the Catholic League, and was major-general of the forces which captured Mantua (1629). He commanded under Wallenstein in Bohemia, fighting against the Swedes at Nuremberg and Lutzen (1632). G. then intrigued against Wallenstein, and after the latter's assassination succeeded to his command (1634), winning a notable victory at Nördlingen. Archduke Leopold superseded him (1638). G. was in command again in 1642, but was defeated by Torstenson at Magdeburg (c. 1641). His army earned a reputation for cruelty, and the word marauder is derived from his *Marode Bruder*. See J. C. Schiller, *Geschichte des 30-jährigen Kriegs* (*History of the Thirty Years War*, trans. 1846).

Gallas, African Hamitic tribe, racially closely allied to the Somalis. Their original home is uncertain, but was probably somewhere in the highland mass lying between the Abyssinian plateau proper and the Somali plain. Some believe that they came across the Red Sea from S. Arabia. From the sixteenth century onwards they have migrated in waves into the main plateau of Abyssinia, and occupied great parts of the S. highlands. It is largely due to the Galla invasions that the aborigines of the S. of Abyssinia have not been assimilated like those of the central highlands. The G. were pagans when they invaded the country, and for the most part remain so in practice. Some Galla tribes, like the Wollo, have become fanatical Muslims. Others have received a faint tinge of Christianity. Much information on them has been gathered from the writings of Baltazar Tellez, a Portuguese Jesuit, who incidentally disillusioned the world on the myth of Prester John. The G. number over 4,000,000, and are still mostly heathen. See A. H. M. Jones and

Elizabeth Monroe, *History of Abyssinia*, 1935.

Gallatin, Albert (1761-1849), Amer. financier and statesman, b. at Geneva. He emigrated to the U.S.A. (1780) and, unsuccessful in trade, supported himself for some time by teaching Fr. at Harvard College. He was elected to the U.S.A. Senate (1793) and made a member of Congress (1795). It was as secretary of the treasury (1801-13) that he first proved himself a great financier. He was mainly responsible for the favourable conclusion of peace negotiations with England in 1814, and himself signed the treaty of Ghent. After filling important diplomatic positions in Paris and London he returned to New York, and retired from public life (1827). His works include *A Sketch of the Finances of the United States* (1796); *Indian Tribes, East of the Rocky Mountains*, etc. (1830); and *Semi-civilised Nations of Mexico, Yucatan, and Central America* (1815). His diary was pub. in 1915. See lives by Henry Adams, 1879, and J. A. Stevens (Amer. Statesman series), 1883.

Gallatin: 1. Cap. of Daviess co., Missouri, U.S.A. It stands on the Grand R., and also on the Chicago, Rock Is., and Pacific and the Wabash railways. Pop. 1500. 2. Cap. of Sumner co., Tennessee, U.S.A., situated on the Chesapeake and Nashville, and on the Louisville and Nashville railways. The Howard Female College is in this tn., which has flour-mills and manuf. spokes. Pop. 3000. 3. Riv. rising in Montana, U.S.A., and is one of the forks of the R. Missouri. It flows in a northerly direction.

Gallaudet, Thomas Hopkins (1787-1851), Amer. and a teacher of the deaf and dumb. He was b. at Philadelphia, and took his degree at Yale. He afterwards became a student of theology at Andover, and after having obtained, in 1811, a licence to preach, visited Europe with a view to teaching the deaf and dumb. He studied in Paris under the Abbé Siard, and in 1816, on his return to America, founded a school for deaf mutes at Hartford, being the head of it until 1830. He wrote sev. works, among them *The Child's Book on the Soul* (1832) and *The Youth's Book on Natural Theology* (1832).

Gall Bladder. This organ is a pear-shaped membranous sac, 3 or 4 in. long and about 1½ in. across its widest part, and capable of containing 8 to 12 fluid drachms. It is lodged obliquely in a cleft of the concave lower surface of the right lobe of the liver. Its large end or *fundus* projects beyond the anterior border of the liver and is directed forwards, downwards, and to the right. Its upper surface is attached to the liver by areolar tissue, its under surface and fundus are covered by the peritoneum, which is reflected over them from the surface of the liver. The neck gradually narrowing is curved S-shape, and then becomes much constricted and changing its general direction. It bends downwards and terminates in the cystic duct. This duct joins, at an acute angle, the single duct made by the joining of the right and left hepatic ducts, and

the common channel to all three is termed the *common bile duct* which runs down to the second part of the duodenum. The chief function of the G. B. is to act as a reservoir for the secreted bile. The secretion of bile from the liver is continuous, unlike the other digestive secretions, which take place only during digestion and cease, more or less, during abstinence. But while the secretion of bile is continuous, its excretion or output into the duodenum is periodic, and coincides exactly with the period of digestion in which the acid chyme is spatulated by rhythmical jets from the stomach to the intestine. It is therefore evident that the bile secreted during abstinence must all collect in the G. B., which, in short, is a lateral diverticulum of the excretory bile ducts, where the bile becomes condensed by absorption of water. The removal of the G. B. from dogs has been accomplished and the animals have recovered quickly without exhibiting abnormal phenomena of any significance. The ultimate result of such removal was a dilation of the various bile ducts to twice or even three times their normal calibre.

The cystic duct in fact appeared to be transformed into a reservoir for the bile, and had the appearance of a newly formed G. B. Experiments made by Oddi in 1887 resulted in the discovery of a special sphincter of plain muscle situated at the duodenal end of the common bile duct. The mechanism by which the flow of bile into the intestine is brought about consists in a reflex diminution in tone of this sphincter caused by the distension of the intestine and the entrance of the chyme from the stomach. It is therefore an inhibitory reflex discharged from a higher centre. The secretion normally poured into the G. B. consists in part of bile reabsorbed from the intestine, that which is collected from the G. B. is a mixture of the secretion from the hepatic cells and that of the epithelia which line the bile ducts and the G. B., and through condensation of the liquid contains up to 16 or 17 per cent of solids.

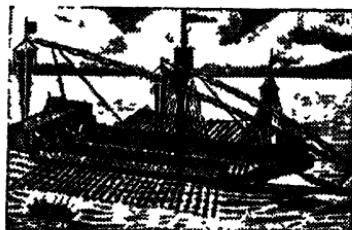
Galle, Johann Gottfried (1812-1910). Ger. astronomer, b. at Pabstshain, near Wittenberg. He was the first to observe the planet Neptune (Sept. 25, 1846), the existence of which had previously been proved by the calculations of the Fr. astronomer, L. J. J. Le Verrier (q.v.). The theory ascribing the formation of halos to the refraction of light by floating ice crystals was completely demonstrated by G. (and A. Bravais). The third ring round the planet Saturn, commonly known as the 'Crape' ring, was first recorded by G. at Berlin in 1838.

Galle, called also Point de Galle, seaport tn. of Ceylon, situated in the S.W. of the is. in the S. prov. It has good harbour, but is not so important now as a port of call for steamers to the E. and Australia, since Colombo is now the port. Tea-planting is a growing industry, and the digging of plumbago, also grass-growing for the distillation of citronella oil. The chief exports are plumbago, coco-nut oil, tea, rope, and coir yarn. Pop. 49,000.

Galleon (Sp. *galeon*), large ship used by Sp. merchants in the fifteenth-eighteenth centuries to convey gold and silver from Mexico and Peru to Spain. The ships, which were armed, possessed three or four decks.

Gallery means a long and narrow passage, raised above the ordinary floor of a room. These Gs. are often to be seen in churches, as in the case of the rood-loft, which is a G. forming a means of support and elevation for the rood or cross; in Norman castles the great hall often had a G. surrounding it. Old mansions were almost always provided with a G., but as a domestic feature the G. only attained importance with the introduction of the Elizabethan long G.; whence the application of the word to a museum of art treasures. Another form of G. is the minstrels' G. of manor houses. For G. in military mining see MINES, Military.

Galley, narrow and long boat having sails, but usually moved by means of oars. Some of these boats were about 160 ft. long and 32 ft. wide, and had as a rule just over fifty oars, each of the latter having six or more men to work it. These



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GALLA

men, who wore chains, were usually either prisoners, Turks, or convicts, and had to work for long periods on these vessels, which were used largely by the Its.

Galley Slaves (Fr. *galériens*; It. *galatotti*), term applied in olden times to convicted criminals who had to work out their hard labour as rowers on board a galley. In later days such convicts were principally employed on the docks and military harbours of France, Spain, and Italy.

Gall-flies are small hymenopterous insects belonging to the family Cynipidae and related to the ants and bees; they are black and wasp-like in shape, with straight antennae. The presence of the larvae results in plant excrescences, or galls (q.v.), from which the insect emerges on reaching maturity. *Rhodites rosa* causes the bedeguar gall which is commonly found on wild rose-trees and also on the cultivated plant. The true gall-makers are called Pseudides, and, in addition to the typical genus *Cynips*, include *Aphilotrix*, *Andricus*, *Neuroterus*. *C. gallaeinctoriae* produces the gall-nuts of commerce, and *C. usana* produces those known as Dead Sea Apples or Apples of Sodom.

Gallia, in ant. geography 'the country

of the Gauls' (Galli), in two great divs., Cisalpina or Citerior (on 'this,' i.e. the Rom. or S. side of the Alps) and Transalpina or Ulterior (across the Alps from Rome). G. Cisalpina extended S. and E. from the Alps, and was bounded in Caesar's time by Liguria, Umbria, and the Rubicon, comprising N. Italy between the Alps and the Apennines. Gallic invaders came here perhaps as early as the sixth century B.C. A Rom. colony was estab. at Sena Gallia (282), the country was reduced after the second Punic war (203), and its conquest finally completed on the defeat of the Boii (191). G. Transalpina extended N. and N.W. of the Alps, comprising all modern France (often loosely called 'Gallia'), Belgium, and parts of Holland, Germany, and Switzerland. The Rom. prov. of G. Narbonensis, originally called the Provincia (later Provence) was formed in the S.E. (121 B.C.). Julius Caesar thoroughly subdued the whole ter. (58–50 B.C.), then divided into three parts, Aquitania (S.W., inhabited by Iberians represented by the modern Basques), Celtic Gaul (in the centre, the cradle of the modern Fr. nation), and Belgic Gaul (N.E., inhabited by Belgae, closely allied to the Celts (central Gaul). Augustus made four provs. (21 B.C.), Narbonensis, Aquitania, Lugdunensis, Belgica. In the second century A.D. Christianity was introduced, and in the fourth century there were two dioceses, Galliarum and Viennensis. After invasions by Vandals, Goths, and Franks in the fifth century, a fresh empire rose on the ruins of the old. See T. Therry, *Histoire des Gaulois*, 1872; E. Desjardins, *Géographie historique et administrative de la Gaule romaine*, 1877; C. Julian, *Histoire de la Gaule* (8 vols.), 1907–28; C. Dottin, *La Langue gauloise*, 1920; and A. Grenier, *La Gaule celtique*, 1915.

Galliard (O.F. *gaillard*), old lively dance in triple time, and much in vogue in the sixteenth–seventeenth centuries. The minuet is a development of the G.

Gallic Acid ($C_6H_5(OH)_2COOH$), one of the six possible trihydroxybenzoic acids, occurs together with tannin (tannic or gallo-tannic acid) in gall-nuts, divi-divi, sumach, etc. It forms colourless silky crystals, having an astringent and slightly acid taste, readily dissolves in hot water and melts at 220°C , at the same time decomposing into pyrogallol and carbon dioxide. G. A. is a powerful reducing agent, readily absorbing oxygen in alkaline solution. With iron (ferric) salts a blue-black solution is produced, from which a black precipitate is finally deposited; uso is made of this in the production of ink.

Gallicanism, title used in theology to describe certain theories which, while recognising the primacy by divine right of the see of Peter, yet limit the power of the pope in temporal matters and in certain eccles. matters. This attitude of resistance to the papal claims was particularly strong in France, and hence the name G. was given to it, while the church in France is known in this connection, as the Gallican Church. G. can only be under-

stood in connection with the rival theory, known as Ultramontanism, which now holds almost complete sway in the Rom. Church. The first clear enunciation of Gallican principles was made in the Pragmatic Sanction (1269) in the reign of St. Louis, which declared that the government of the church should be carried out in conformity with the common law, the canons of the councils, and the statutes of the anc. fathers. It was still further developed by Philippe le Bel in his conflict with Pope Boniface VIII. The most celebrated expression of G. is found, however, in the Four Propositions of 1682, drawn up by Bossuet and signed by thirty-five bishops and thirty-five other clergy. The propositions are: (1) That the pope's jurisdiction is in things spiritual and not in things temporal, and therefore that kings are not subject to eccles. authority in such matters; (2) that the authority of a general council is at all times superior to that of a pope; (3) that the authority of the pope is to be limited by the canons of the universal church, and that the rules, customs, and institutions of the Gallican Church and kingdom remain intact; (4) that the judgment of the pope is not infallible unless it be afterwards confirmed by the whole church. These declarations, especially the last three, were frequently condemned by the papal authority, and Ultramontanism if not in its extreme manifestations is now substantially triumphant. G. throws much stress on the authority of the civil power, and has therefore been generally condemned as Erastian.

Galli-Curci, Amelita (b. 1889), Ital.-Amer. coloratura soprano, b. at Milan, Italy, of mixed It. and Sp. extraction. Educated at International Institute and Lyceum High School, Milan; studied piano, composition, and harmony at Royal Conservatoire, Milan. Self-taught as a singer. Made débüt as Gilda in *Rigoletto*, at Costanzi Theatre, Rome, 1909; married Marquis Luigi Curci of Sanceri, 1910. Made débüt in U.S.A. with Chicago Opera Association, at Auditorium, Chicago, as Gilda, 1916; débüt in New York, 1918, at Lexington Opera House, in *Dinorah*. Divorced, 1920. Married, 1921, at Minneapolis, Homer Samuels. Began performances with Metropolitan Opera Company, Nov. 14, 1921, as Violetta in *La Traviata*. Other parts she has sung are Mme Butterfly, Juliette in *Romeo et Juliette*, Lucia in *Lucia di Lammermoor*, Lakmá, Mimi in *La Bohème*, Elvira in *I Puritani*, and Leila in *The Pearl Fishers*. Her great reputation in England was made largely on gramophone records of her best vocal performances.

Gallieni, Joseph Simon (1849–1916), Fr. soldier and colonial administrator whose fame rests on the great share he had in winning the first battle of the Marne (1914); b. at Saint-Béat in the Haute-Garonne, and received his military education at St. Cyr. He fought bravely in the Franco-Ger. war of 1870, and increased Fr. power in Senegambia, whither he was sent as captain in 1878. He served with distinction in the Sudan and crushed

brigandage in Tonking. He was made governor-general of Madagascar in 1896, and general of div. on his return to France in 1899. In 1904 he was military governor of Lyons, and when the First World War broke out he had virtually retired. At that time he was military governor of Paris, and when the Ger. right wing under Gen. von Kluck changed its direction from S.W. to S., thereby leaving Paris on its right, G. at once began to organise his command, and the troops sent by Marshal Joffre to augment it, for a blow at the exposed Ger. right wing when the right moment arrived. The threat was noticed by von Kluck, who halted and faced W. to meet it. It was this movement that arrested the victorious Ger. progress towards Paris. He became war minister in 1915, but resigned in 1916, and d. in May of the same year. He wrote *Trois colonies au Tonkin* (1894-95), *La Pacification de Madagascar* (1900), and *Neuf Ans à Madagascar* (1908). See P. Ellie, *Le Général Gallieni*, 1900, and P. Ghysel, *Le Maréchal Gallieni*, 1921.

Gallieno, Richard Le, see LE GALLIENNE.

Gallienus, Publius Licinius, Rom. emperor (A.D. 260-68), and co-regent with Valerian, his father, from 253 until the latter's capture by the Persians in 260. G.'s reign is historically known as 'the time of the Thirty Tyrants,' for usurpers arose throughout the provs. The most prominent, Aureolus, was proclaimed emperor in Illyricum, invaded Italy, captured Milan, and advanced on Rome. G. defeated him, but later, while besieging Aureolus in Milan, was himself put to death by his own officers. Claudius II. succeeded him.

Gallifet, Gaston Alexandre Auguste, Marquis de, Prince de Martignes (1830-1909), Fr. general, b. in Paris, who distinguished himself in the Crimea, the It. campaign (1859), Mexico (1863), and at Sedan in 1870. He commanded the 3rd Chasseurs d'Afrique in the Franco-Ger. war (1870-71), winning fame by his heroic cavalry charge at Sedan. He earned a character for severity by his rigorous measures against the Communists. See his *Mes Souvenirs*.

Gallinaceous Birds, or Galliformes (Lat. *gallus*, a cock), constitute an order under which are included such birds as the Phasianidae, or pheasants, the Tetraonidae, or grouse, the Turnicidae, which include the bustard or button-quails of India, the Megapodiidae, or mound-makers; the Cracidae, curassows, and guans; and the Opisthomocomidae, the curious hoatzins, or 'stinking pheasants' of S. America. They are a widespread group, being found in almost every part of the globe, and they include almost every variety of plumage and shape from that of the common domestic fowl to the beautiful silver pheasant of S. China, which is embroidered as an emblem on mandarins' dresses.

Gallo, Junius Annæus, - Rom. pro-consul of Achaea under Claudius, while St. Paul was at Corinth, A.D. 53-54. He was a brother of Seneca and uncle of

Lucan. Ill health induced him to resign, and he was either put to death by Nero's order or committed suicide in 65. His name is now synonymous with an easy-going man, unwilling to shoulder responsibility.

Gallipoli: 1. Well-fortified seaport tn. in S. Italy, 50 m. S. of Brindisi, built on a steep rock in the gulf of Taranto. Its chief industries are tunny-fishing and the export of fruit, wine, and olive oil, which is deposited in basins excavated out of the solid rock. Pop. 14,500. 2. Turkish seaport tn. on a peninsula at the N.E. extremity of the European side of the Dardanelles. It has been Turkish property since 1357. The Venetians defeated the Turks here in 1416. Trades in corn, wine, and oil. The magazine and collars built by Justinian and other anc. remains are in the vicinity. The tn. boasts two harbours and is the prin. station for the Turkish fleet. It was fortified by the Eng. and Fr. in 1854 and these fortifications were renewed and enlarged in 1878. The guns of G. command the Dardanelles just before the strait joins the sea of Marmora. Pop. principally Gk., Turks, Armenians, and Jews, 18,000.

Gallipoli Campaign (1915-16). The political considerations which actuated the Brit. Gov. in launching this much-criticised campaign in the First World War will be found under WAR, FIRST WORLD. The naval operations of the early part of 1915-16 in which the allied Anglo-Fr. fleets endeavoured to force the passage of the Dardanelles are described under DARDANELLES. This article deals with the military or land operations in the peninsula.

The immediate purpose of the attack on the Dardanelles was to force the straits in order to deal so effective a blow against the Turks that the pressure on Russia might be relieved and Bulgaria deterred from active adherence to the cause of the central powers. There is no doubt that had the attack been crowned with success Turkey would have been out of the war, whilst the check to Ger. aspirations in the S.E. (see also BAGHDAD RAILWAY) would have been so serious that the war might well have been curtailed by as much as two years.

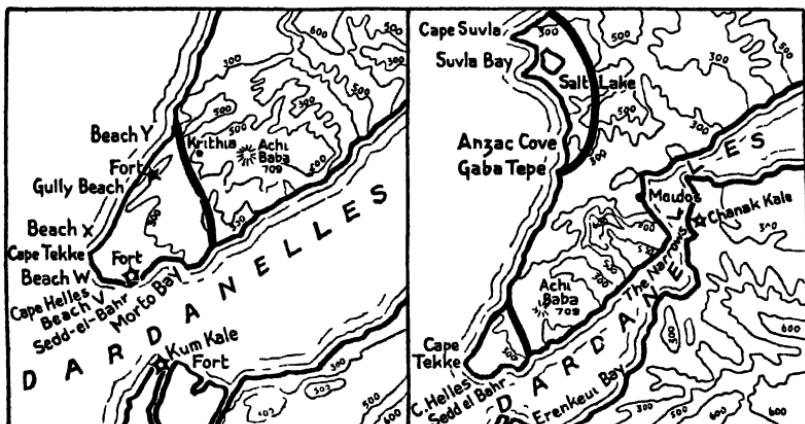
Experience having taught the necessity of a combined land and water expedition the Brit. Cabinet resolved to send out a force to Gallipoli to co-operate with the fleet. It was hoped by effecting a landing of soldiers on the European side of the peninsula to storm Gaba Tepe (q.v.), Achi Baba (q.v.), and other formidable forts and thereby to facilitate the task of the ships in running the 40-m. gauntlet of the straits.

Cape Helles and Anzac Cove Operations.—In the last week of April 1915 two divs. of the Australian Imperial Force and troops of the 29th Div. effected a landing at Helles at the S. tip of the peninsula and also at Anzac Cove (as it was subsequently called), which lies some 15 m. to the N. of Cape Helles. The landing at Helles forms one of the most poignant episodes of warfare, the men scrambling through the

water in the face of a murderous hail of bullets and seeking in every conceivable way to shelter themselves on an exposed beach offering nowhere any hope of throwing up defensive works speedily enough to avoid grave casualties. The Australian and New Zealand troops brilliantly scaled a series of steep cliffs and with the most dogged resolution gradually dug themselves in. In particular the ruse by which the *Clyde*, an old troopship which, like the wooden horse of Troy, concealed numbers of armed men, was brought close up to the shore and the men rapidly disembarked through an improvised gangway, will live long in the annals of the First World War.

Krithia). But, in view of the Turkish reinforcements, it was decided to send out, in addition to the 52nd Brit. Div., three more regular divs., and two territorial divs. of infantry. Among these latter were the Lancashire Fusiliers, and troops of the Manchester Infantry Brigade and E. Lancashire Brigade.

The Suvla Bay Plan.—The new plan was to land troops at Suvla Bay and by a combined advance from there, and from Anzac Cove on the heights of Sari Bair, to cut the Turkish communications on the Gallipoli peninsula. The prin. battles of this ill-starred plan, which began on Aug. 6, were the battles of Sari Bair and Suvla (Aug. 6-15); but, although the allied



GALLIPOLI AND THE DARDANELLES

The map on the right shows the three main theatres of operations Suvla Bay, Anzac Cove, and Cape Helles, while on the left is a more detailed map of the Cape Helles area with the well known names of the places where landings were effected. The black lines show the final positions of the Allies' troops before the evacuation.

The Battles for Krithia and Achi Baba.—It was decided, after the landing was effected, to make a combined advance by forces from both the S. and the W. This attack eventuated in the sanguinary battle of Cape Helles and the battles for Krithia, the objective being the commanding height of Achi Baba. The attack, however, failed, the enemy being fully prepared, the terrain being ill adapted for offensive operations and the foe being constantly reinforced, as the attack dragged on, by ever more overwhelming numbers. A little ground, however, even against heavy Turkish counter-attacks, was gained during these battles and, in the course of other engagements, during May, Jr May, June, and July the Turkish armies received a great accession of strength through Russia being forced to abandon her initial plan of co-operating with the Fr. and Brit. from the Black Sea. During these months heavy engagements were fought on May 6-8 (second battle for Krithia) and June 4 (third battle for

forces were foiled in their plan, they undoubtedly made such a drain on the Turkish forces that the repercuSSION was felt both in Syria and in Mesopotamia. Some have supposed on what seems tolerably reliable evidence that the attacking troops were within a very narrow margin of accomplishing their object and that if they had continued their operations those would have been successful within a very short space of time.

Sari Bair and Suvla.—The operations involved an advance from Anzac on the Sari Bair hills, a landing at Suvla Bay, and an advance thence to join up with the colonial troops. The advance on the Sari Bair heights had to be carried out over numerous ravines, and though the heights were reached, the Turkish troops, by heavy counter-attacks, drove the allied forces out again. Added to this check was the failure of the Suvla Bay operations. Troops were landed under cover of night, but grave difficulties of transport and water supply nullified any

advantage that might have been gained by this surprise. Far more casualties indeed occurred through dysentery, from lack of water, and general disorganisation of auxiliary services, than through actual fighting, there being in fact but little resistance to the landing parties. The result of these failures was that the attempt to clear the European side of the straits was abandoned; but it was made clear to the world through official pronouncements that the Allies would certainly remain on the peninsula. This they did until the end of the year, the troops digging themselves in and carrying on months of very trying trench warfare.

d of wounds; 8000 missing and prisoners; 74,000 wounded. In all there were about 327,000 combatant troops and 141,000 non-combatant troops employed from time to time. The maximum strength at any one time was about 85,000 combatant and 42,000 non combatant troops.

Gallipoli, Strait of, see DARDANI LLI 9.

Gallitzin, Dmitri Augustin, see under GILBERTIV.

Gallium, metallic element first discovered by Lecoq de Boisbaudran in 1875 by spectroscopic analysis of a zinc blende from Pierrefitte in the Pyrenees. It occurs in blenders from different localities and also but in minute amounts in other



Lepidolite

III GALLIPOLI CAMPAIGN TROOPS LANDING AT ANZAC COVE

which at least had the effect of greatly impairing the Turkish forces. The endurance of the allied troops during this terrible campaign, with its casualties from constant sniping, occasional hand to hand engagements, disease through the trying climate, and lack of water, is a veritable epic in British history.

Results of the Campaign —The principal object of the Gallipoli operations was not effected and the evacuation, brilliantly carried out in Dec 1915 and Jan 1916 brought the operations to a close. The conception was sound, but the means at the disposal of the Allies, and the inevitable disorganisation resulting from local circumstances rendered its execution all but impossible. That the enemy—and especially the Germans—believed the attack would succeed appears from a most indiscreet article written in 1915 by Maximilian Harden in the *Zukunft*, in which periodical the writer prepares his readers for the Allies' success. It need hardly be said that the pub. of this article resulted in the temporary suppression of this well-known periodical. Indirectly, however, the campaign achieved notable results in the wastage of the Turkish armies, which, apart from the victory over Gen. Townshend's small force at Kut, never seriously hampered the steady pressure of the Brit. & Fr. in Palestine and the Brit. in Mesopotamia and the Russians in Armenia.

Casualties (approx.): 30,000 killed and

minerals. G is obtained by dissolving the ore in acids, treating with zinc to precipitate the foreign metals and dissolving the precipitate in hydrochloric acid and throwing out the G in the cold with zinc. Subsequent fractionation yields G in the pure state. In properties G is similar to aluminum. It has a characteristic spectrum two lines in the blue and violet. Atomic weight 70, atomic number, 31, symbol G , melting-point, 30° . It is identical with Mendeleef's hypothetical eka-aluminum. G is very widely distributed, but usually in very minute quantities. It seems likely to find industrial application in electric lamps and in optical apparatus.

Gallivara, or Gellivara, tn of Sweden, situated about 130 m NW of Lulea, with which port it is connected by rail. There is also a railway line connecting G with the Ofoten Fjord Norway. The iron mines near this tn are exceedingly productive, the output being considerably over 1,000,000 tons per year. Pop. 12,500.

Gall-midges, minute dipterous insects belonging to the family *Cecidomyiidae*, which live in the different parts of plants or under the bark of trees. Certain species of *Miasstor* and *Ongarces* possess the remarkable power of reproduction whilst in the larval state. *Cecidomyia destructor*, the licean fly, is injurious to cereals, and is a great pest in some parts.

Gallon, O.E. measure of capacity, which underwent much alteration until the present imperial G., containing four quarts, was fixed by Act of George IV., 1824, as the standard unit of measure for liquids throughout the United Kingdom. This imperial G. contains 10 lb. avoirdupois of distilled water—277.274 cub. in. A wine G. in the reign of Queen Anne (1707) held 231 cub. in., the same measure of capacity as the G. in America to-day.

Galloway, Joseph (c. 1731–1803), Amer. lawyer and anti-nationalist; b. in Kent co., Maryland; early removed to Philadelphia. Member of the Pennsylvania Assembly during most of the period 1757–1774. He was against proprietary government and advocated the erection of Pennsylvania into a royal prov. He married a daughter of Lawrence Grogdon, Speaker of the House, and was himself Speaker 1766–71. Opposing the ideas of the revolution, he proposed, as a member of the Congress of 1774, a scheme of government consisting of a president-general, appointed by the king, and a grand council elected for three years by the various assemblies of the colonies. This was rejected by a narrow majority. In Dec. 1776 G. joined the *Reb.* Army under Sir Wm. Howe, and he became superintendent of prohibited articles at Philadelphia on its capture. He accompanied the army to New York. In 1778 he went to England, and his estate of £10,000 was confiscated by Congress. He wrote many pamphlets – on Amer. and biblical subjects.

Galloway, fertile and extensive dist. in the S.W. of Scotland, comprised in Wigtonshire and the stewartry of Kirkcudbright. It is bounded by the sea, the Solway Firth, and the R. Nith, and is divided into Upper and Lower G. famed for its breed of small horses and hornless black cattle, with dairy-farming as its prin. industry. The climate is mild, and there is much diversity of scenery. G. is associated with the story of the Covenanters. G. contains a predominantly Celtic element and, indeed, it is not very long ago that the Gaels of G. died out. The first waves of the Celts who arrived in Britain are traced to G. and the region between the Solway and the Clyde, and they retained their identity and language longer than was the case anywhere else in the S. of Scotland where they settled.

Galloway Bread, see under *CYTRIA*.

Galloway, Mull of, rugged and mountainous promontory, situated at the S.W. extremity of the G. peninsula, and the most S. point of Scotland. On its E. side it rises to a height of 210 ft., crowned by a lighthouse 60 ft. high. Small horses, known as Galloways, are bred here, also large numbers of sheep and cattle, chiefly for Eng. market.

Gallowgese, see *ELLACIC ACID*.

Gallowglass (Irish *giolla*, a manservant), heavy-armed foot soldiers or chieftains' retainers who fought in the old Irish wars. Armour-bearers in the Scottish Highlands were once so called and are mentioned in Shakespeare's *Macbeth* as coming, with Kernes, from the W. Isles of Scotland.

Galls, excrescences or tissue-bodies produced in plants by the presence of parasitic insects or fungi; they vary greatly in form, some of them being complicated structures resembling fruits and flowers. The so-called oak 'apples' are a well-known example. See **GALLFLY**.

Gall-stones, **Cholelithiasis**, **Hepatic Calculi**, or **Biliary Calculi**. G. are found in the gall bladder and biliary ducts of man and most vertebrate animals, being especially common in oxen. Their size varies from that of small gravel to large stones quite 5 in. in length. When large the stones are usually found singly and of a rounded or oval shape. The smaller, wedge-shaped ones are generally more numerous. Their colour ranges from white to black, but is generally brown. Chemically they are a compound of lime and bile pigment, with traces of mucous and phosphatic earths; the larger and lighter coloured stones are covered with cholesterol. G. are rare before puberty, and most common after thirty years of age. They are usually associated with a sedentary life and excesses or irregularity of diet. They are frequently found in cases of cancer of the liver and adjacent parts. While still in the gall bladder, the stones give rise to no symptoms—in some cases patients may never have any indication of their presence. It is only when the stones leave the gall bladder and escape into the cystic duct that inflammation is set up in the gall bladder and biliary passages.

Cholecystitis.—When the stones enter the bile passages, they give rise to biliary colic, that is to say, intense pain on the right side of the abdomen, below the ribs. This attack is followed by jaundice within twelve to forty-eight hours. The pain usually lasts until the stone is passed out of the duct or falls back again into the gall bladder, which may take place in a few hours or only after sev. days. The attacks may recur from time to time as new stones leave the bladder. The treatment consists in the immediate relief of pain by the application of heat, fomentations, hot baths, and other means, as well as the administration of hypnotics, either by the mouth or through the skin.

The prevention of biliary colic consists in giving considerable quantities of boiled water or weak alkaline mineral waters. Considerable benefit results from taking four ounces or more daily of olive or other oil. If, despite internal treatment and regulated diet, the trouble still continues, operative measures (opening and draughting of the gall bladder) must be resorted to, as they alone will give relief.

Gallup, George Horace (b. 1901), director of the Amer. Institute of Public Opinion, b. at Jefferson, Iowa. Educated at the state university of Iowa, and from his studies in psychology made a profession of investigating the tastes of newspaper readers. In 1935 he founded the G. Institute, which conducts research by means of 'straw polls' to determine public opinion on political, social, and economic problems. The results are then placed at the disposal of

the press. The institute made remarkably accurate forecasts of the results of three U.S. presidential elections, but in 1948 it was completely wrong when it stated that Governor Dewey would win by a substantial majority. See G. H. Gallup and S. F. Rae, *Pulse of Democracy*, 1940.

Gallus, *Allius*, learned jurist and contemporary of Cicero. A single excerpt is given in the *Digest* (50, tit. 16, s. 157) from a treatise he wrote on the signification of terms (*Gellius*, x. 22).

Gallus, *Caius Aquilus*, Rom. equestrian, was made praetor in 66 B.C. He was a pupil of Q. Mucius Scævola the Pontifex, and became celebrated as a jurist. His writings were ed. by Servius Sulpicius, his pupil, and himself a famous jurist. Cicero eulogised G. in an oration for having promulgated an editorial rule on fraud in matters of buying and selling.

Gallus, *Caius Cornelius* (66–26 B.C.), Rom. poet, b. at Forum Iulli (Fréjus) in Gaul, and the friend of Virgil and Ovid. Augustus sent him as general to Egypt, where he defeated Antony's forces and captured and imprisoned Cleopatra. Upon her death (30 B.C.) and the conversion of Egypt into a Rom. prov., G. was made first governor. Four years later he was deposed and exiled by order of Augustus, but preferring death to dis-honour he committed suicide. He wrote four books of elegies not now extant. He was the hero of W. A. Becker's well-known story *Gallus*, 1838, Eng. trans. by Metcalf (London, 1866).

Gallus, *Julius Aquila*, jurist under the empire of uncertain date. The *Digest* contains two excerpts from his work, *Liber Responsorum* (26, tit. 7, s. 31; and 26, tit. 10, s. 12).

Gallus, *Trebonianus*, a Rom. emperor (A.D. 251–54), is said to have been treacherously concerned in the defeat and death of Decius, whom he succeeded. After his accession G. concluded a dis-honourable peace with the Goths, conceding them a fixed ann. tribute and allowing them to retain their captives and plunder. He was killed by his own soldiers when on the march to suppress another Gothic invasion.

Galluzzo, vil. and com. of Italy in the prov. of Florence, Tuscany. It lies 2 m. S.W. of Florence. In the fighting of 1944 the Carthusian convent suffered many shell-hits, but the Pontormo frescoes were undamaged. Pop. 20,000.

Gally, Merritt (1838–1904), Amer. inventor, b. near Rochester, New York. He was ordained Presbyterian minister in 1866, but resigned owing to voice trouble, and interested himself henceforward in mechanics. He took out more than 400 patents, many connected with printing machinery. His inventions included the Univ. printing press, a machine for the manuf. of printers' types from cold metal by swaging, and the composite swage-locked type-bar or linotype. He was also the inventor of the "orchestrone," and made many productive experiments with automatic musical instruments.

¹ Galston, tn. in the co. of Ayr, Scotland. It stands on the Irvine, E. of Kilmarnock,

and is engaged in coal-mining and the manuf. of muslin and cotton goods. Pop. 4700.

Galsworthy, John (1867–1933), Eng. novelist and dramatist, b. at Kingston Hill, Surrey. Educated at Harrow and at New College, Oxford, where in 1889 he took an honours degree in law. Instead of going to the Bar, like his father, from 1881 to 1886 he travelled round the world, and on the sailing ship *Torrens* met Joseph Conrad. In 1898 he pub. a book of stories, *From the Four Winds*, under the name John Sinjohn; also in 1898 the novel *Jocelyn*, in 1900 another novel, *Villa Rubin*, and in 1900 *A Man of Devon* and other tales. *The Island Pharisees*, a novel pub. in 1904, was the first book to be pub. under his own name. In 1906 the novel *The Man of Property* was pub. This novel, the first of that great series of novels 'The Forsyte Saga' and 'The Modern Comedy,' is the most dramatic of his novels, and the complete saga probably his greatest work. He himself says of the Saga that it 'cannot be absolved from the charge of embalming the upper middle-class life,' and in the complete success of this undertaking consists the greatness of 'The Forsyte Saga.'

In 1906 (i. first became known as a dramatist with the play *The Silver Box*. In 1907 came the comedy *Joy* and the novel *The Country House*. A vol. of sketches, *A Commentary*, was pub. in 1908 and in 1909 the important novel *Fidelity*; also during that year the play *Strife* was first performed, to be followed in 1910 by *Justice*, and another vol. of sketches, *Motley*, and in 1911 by the novels *The Patrician*, *The Inn of Tranquillity* (further sketches), and the play *The Little Dream*. In 1912 he pub. a book of verse, *Moods, Songs and Doggerels*, and the original tragicomedy *The Pigeon* and the play *The Eldest Son* were first performed. The novel *The Dark Flower* and *The Fugitive*, a drama, came in 1913; the novel *The Freelands* and the play *A Bit o' Lore* in 1915; in 1917 *Beyond*, a novel, and the play *The Foundations*, in 1918 *Indian Summer* of a *Forsyte*, a delicate short story, later included in 'The Forsyte Saga,' *The Fire Tales*, *Another Sheaf*, *The Burning Spear*, and *The Saint's Progress* in 1919. In 1920, *In Chancery*, the second vol. of 'The Forsyte Saga,' was pub., and in 1921 the last vol. of the trilogy, *To Let*. *The Skin Game* was first performed in 1920, and in that year *Tatterdemalion*, a collection of war stories, was pub.; the comedy *A Family Man* was produced in 1921, and in 1922 *Loyalties* and *Windows*. More tales, *Captures*, appeared in 1923, and in 1924 *Old English*, an earlier story dramatised, was first performed, and later in that year the play *The Forest*. At this time also *The White Monkey*, the first book of the second trilogy, 'The Modern Comedy' was pub., to be followed by the second book, *The Silver Spoon*, in 1926 in 1927 by two interludes, later to be included in the second trilogy, and in 1928 by the last book of the cycle, *Swan Song*. Another play, *The Show*, was produced in 1925,

and in 1926 the drama *Escape*. A selection of earlier and unpublished poems, *Verses New and Old*, was pub in 1921, in 1927 a book of essays, *Caskets in Spain and other Scraps* and *The Way to Prepare Peace*. *The Irons*, a play, in 1929 and in 1930 a book of short stories *On Forsyte Change*. In 1929 he was awarded the Order of Merit and in 1932 the Nobel prize for literature. His last novel *Klouzering Wilderness* appeared in 1932. *Over the River* was pub posthumously in 1933.



JOHN GALSWORTHY

G. is sometimes considered to use too much propaganda in his works, particularly in his plays, but he uses it rather as a technique than as the purpose of his plays. He is ironical but humanitarian reserved and this reveals itself in reticence and sparseness of words in dialogue—and although seemingly oppressed by the sadness of life he has a sense of humour at its best when ironical and a great appreciation of beauty. His work is influenced by Turgenev and Maupassant whom he read a great deal in his youth but it is essentially Eng. *The Silver Box* is a play typical of his dramatic methods and *The Man of Property* contains the essence of his greatness as a novelist. It has been well said that if no biographic details were available about G. it would be possible to deduce from his works and from their style that he was an aristocrat and that he had had a legal training. His books are not especially rich in incident, but they convey an almost

unique effect of abstract beauty suspended in an ethereal atmosphere. His purpose as a novelist, which will be found stated allegorically in his *Inn of Tranquillity*, is that of a light bearer in dark places—to show in a detached manner what is there whether good or bad, but readers are very divided on the question of his reputed impartiality. This conviction is irresistible however that the dominant motif of his work is the cult of the under dog in which motif he reveals the influence of Turgenev and of other Russian novelists. Like a judge he weighs the evidence but his emotions are apt to colour the impartiality of his presentation. In G.'s world love is closely related to pity and hate is half brother to fear. His plays show a remarkable economy of construction, but in the later work the economy of style and characterization is so extreme as to produce the effect of inciseness and want of human warmth. See lives by Sheila Kaye Smith 1916, L. Schallert 1928, and H. Ould 1931 and H. V. Mairiot, *The Life and Letters of John Galsworthy*, 1933.

Galt, Sir Alexander Tillichs (1817-93) Canadian politician b. in Chelsea. In 1833 he went to Canada and in 1849 sat in the Canadian Parliament. From about 1855 to 1862 he was the minister of finance and in another administration from 1864 to 1866 and eventually became first finance minister of the Dominion of Canada. From 1868 to 1883 he was in England his commissioner to the dominion. He wrote *Our Liberty in Lower Canada* (1876) and *The Future of the Dominion of Canada* (1891).

Galt, John (1777-1839) Scottish novelist and dramatist son of a sea captain b. at Irvine, Ayrshire. He first worked unsuccessfully in London then travelled extensively on the Continent, where he made friends with Byron (of whom he wrote a life). Returning to England he pub. *Letters from the Levant* in *Blackwood's Magazine*, *The Ayrshire Legatees* (1820) and his masterpiece *Innals of the Parish* in the following year. He became secretary for the Cunard Company where he founded the town of Guelph but returned to England a ruined man and devoted himself henceforward to literature. He pub. his *Autobiography* (1833), *Editorial Life and Miscellanies* (1834), and a number of novels including *The Provost* (1822), *Sir Andrew Wyllie* (1822), and *Laurie Todd* (1830). He married the daughter of Dr. Lillo, the proprietor of the *Star* newspaper for which he worked. G. was a brilliant but unequal writer, unrivalled in his delineation of life in small Scottish towns. An ed. of his works, with introduction by S. R. Crockett was pub. in 1891. See lives by W. Macrae 1830; Sir Douglas, 1897, and J. W. Aberdein, 1916.

Galt city of Ontario, Canada, 54 m. W of Toronto and 24 m. N W of Hamilton. On main line of Canadian Pacific railway, and branch lines of Canadian National railways with electric railways to Kitchener and Brantford Market

centre for tns. of Preston and Hespele and vils. of Ayr, Blair, Dumfries, etc. It lies in a rich agric. dist., and has thirteen churches, three parks, two hospitals, a co-education school, and a fine public library. Industries include boilers, boots, brass goods, edge tools, engines, farm implements, leather, belts, lime, lumber, safes, soap and oils, nails, etc. The neighbourhood supplies limestone, sand, lime, and natural gas. It is named after John G. (q.v.), Pop. 15,000.

Galton, Sir Francis (1822-1911), anthropologist, cousin of Charles Darwin, was b. at Duddleston, Warwickshire. Educated at King Edward VI's Grammar School, Birmingham, he became medical student at Birmingham Hospital and King's College, London, and took his degree at Trinity College, Cambridge (1844). In 1850 he explored unknown parts of S. Africa, embodying his experiences in his *Narrative of an Explorer in Tropical South Africa*, 1853 (which gained for him the Royal Geographical Society's gold medal), and *Art of Travel*, 1855. He was made member of the Meteorological Council, general secretary of the Brit. Association (1863-68), president of the anthropological section (1883 and 1887), president of the Anthropological Institute (1885-86). He devoted himself to the study of heredity, and endowed a research fellowship for the study of eugenics in the univ. of London (1904). He systematised finger-print methods of crime detection. He received a knighthood in 1909. His prin. works are *Meteorographica* (1863); *Hereditary Genius* (1869); *English Men of Science, their Nature and Nurture* (1874); *Human Faculty and its Development* (1883); *Natural Inheritance* (1889); and *Memories of My Life* (1908). See life by K. Pearson, 1914-24.

Galuppi, Baldassare (1703-85), famous It. composer, particularly noted for his comic operas, b. at Burano, near Venice. He also wrote sacred music and sonatas for the harpsichord. He has been called the 'father of Italian comic opera.' See F. Raabe, *Baldassare Galuppi als Instrumentalkomponist*, 1928.

Galvani, Luigi (1737-98), It. physiologist, b. at Bologna, and in spite of his own wish to enter the church was educated for the medical profession. He attained great fame as a comparative anatomist at the univ. of Bologna, where he became a lecturer. His greatest discovery was pub. in the treatise called *De Tribus Electricitatibus in motu Musculari Commissariis* (1791). He was not a brilliant teacher, but owed his fame chiefly to his research work. The word galvanism is derived from his name, as also galvanometer. His whole research was directed towards ascertaining the relation of animal muscle to electricity. He refused in 1797 to take the oaths of the gov. of the new Cisalpine republic, and was deprived of his chair at the univ. Before he could be reinstated he died.

Galvanising, name applied to the process of coating iron or steel with another metal, usually with zinc to preserve it from rusting. The iron, thoroughly

cleaned by scouring with dilute sulphuric or hydrochloric acid and sand, is dipped into a bath of molten zinc covered with ammonium chloride to act as a flux, whereby a protecting layer of zinc-iron alloy is formed on the outside. The temp. of the bath varies from 450° to 480° C. It was first practised about 1837; iron so treated withstands the action of air and moisture better than tinplate (q.v.), hence it is extensively used for single wire, wire-netting, corrugated roofing, cooking vessels, chains, water tanks, etc. *Galvanising* is employed to improve the adhesion of the galvanised coating, and is usually applied to give flexibility to galvanised wire. The wire is passed immediately after galvanising, through a furnace maintained at 650-700° C. for about 15 min.

Galvanism, term applied to the method of alleviation of pain and cure of disease by means of a current of electricity. The current may be obtained from a battery of cells, or by means of a switchboard where electrical power is available. An alternating current may be used instead of a direct current, and is often of much value for therapeutic purposes. The terminals of the source of the current are connected to metallic electrodes which are covered with some absorbent material. To make the resistance of the skin of the patient as low as possible the electrodes and the skin are well wetted with a solution of sodium bicarbonate. The electrodes are applied to the body and the current passes from the one to the other through the body. Great care must be taken to prevent the metal touching the skin, and to avoid too strong a current.

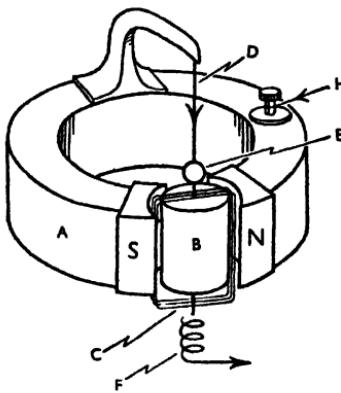
Galvanometer, instrm't used in electrical work for the detection and measurement of small currents. GS. are of several distinct types, their designs and constructions being dependent upon the tasks they are required to perform.

Moving-magnet Galvanometers. - The earliest and also the most sensitive modern instruments are of this type. If a current is passed round a flat coil of wire the coil acquires the properties of a flat sheet of magnetised material, and one of its faces acts as a N. and the other as a S. pole for as long as the current continues to flow. Suppose that a flat circular coil is fixed in a vertical plane with its axis normal to the earth's magnetic field, and that a short bar-magnet is supported on a pivot at the centre of the coil. When a current is passed round the coil the magnet is deflected, and its position of rest is determined by the ratio of the strengths of the magnetic fields due to the earth and the current; the strength of the current can thus be inferred from the deflection of the magnet. This is the principle of the tangent GS., an instrument that was at one time used for measuring currents, but is now obsolete. The moving-magnet GS., however, is still extensively used for the detection and measurement of very small currents, although the simple construction described requires considerable modification. To make the instrument as sensitive as

possible it is necessary (a) to make the magnetic field produced by the current as strong as possible, (b) to reduce to a minimum the other forces which act on the magnet and resist its rotation; and (c) to provide means for detecting very small movements of rotation: (a) is achieved by using a small coil with very many turns of fine wire. To eliminate friction at the pivot the moving magnet is suspended from fine quartz fibre that is so thin that it exerts only a very small couple to oppose rotation, and the controlling field of the earth is reduced by placing near the coil a permanent magnet whose magnetic field at the centre of the coil opposes, and is nearly equal to, that of the earth. The effect of the small residual controlling field is also further reduced by replacing the single suspended magnet by an astatic pair. This consists of two similar small magnets rigidly connected together, with the N. pole of one pointing in the same direction as the S. of the other; if these magnets were exactly alike the pair would experience no controlling couple in a uniform magnetic field. If the coil carrying the current passed in the same direction round both magnets of the pair the deflecting couple due to the current would also be very small, since the couple exerted on one magnet would be balanced by that on the other. This can be avoided, however, by winding the coil in the shape of a figure 8, and arranging that one magnet lies in the upper and the other in the lower loop of the 8; the current then passes in opposite directions round the two magnets and the couple on one reinforces that on the other. Finally the deflection of the magnet system is measured with the aid of a small mirror rigidly attached to the suspended system. A beam of light passes from a lamp to the mirror and is reflected from it to a distant scale. When the magnet system is deflected the reflected beam rotates about the mirror as centre, and the movement of the suspended magnets is indicated by that of the spot of light on the scale. Formerly a serious disadvantage of moving-magnet Gs. was that they were affected by variations of the intensity of the external magnetic field, and, although shielded by iron cases, they were not satisfactory in the vicinity of electrical machinery, etc. This led to their supersession for most purposes by moving-coil Gs. More recently it has been found that the difficulty can be overcome if they are surrounded by a shield made of mumetal, an alloy of iron and nickel. Some idea of the sensitivity of a moving-magnet G. may be obtained from the fact that a deflection of 50 min. on a scale distant one metre from the instrument may be produced by a current of one thousand millionth of an ampere.

Moving-coil Galvanometers.—In this type of instrument the current passes round a flat coil suspended in the magnetic field of a powerful fixed magnet, and causes the coil to rotate. The principle is illustrated in the figure. A permanent magnet A is fitted with concave iron pole pieces NS, and produces a strong and nearly uniform

field in the gaps between these and the soft iron cylinder B. The coil C, to which is rigidly attached a small mirror E, is suspended in the gaps between the pole pieces and cylinder by a phosphor bronze ribbon D. The current enters at H, passes by way of the magnet and the suspension D to the coil, and leaves via the fine wire F, causing the coil to rotate to a new position where the couple due to the magnetic forces between the magnet and coil is balanced by the mechanical couple due to the twisting of the ribbon D. The rotation of the coil is measured by the movement of a beam of light reflected from the mirror. Such an instrument is practically unaffected by changes of the external field, since the coil lies in the intense field of the permanent magnet,



MOVING-COIL GALVANOMETER

but it cannot readily be made as sensitive as the moving magnet type of G. This is now of less importance than formerly, however, for means are available for increasing indirectly the sensitivity to any desired extent, subject to the limitations imposed by Brownian movement of the coil. To attain this sensitivity the light reflected from the mirror is made to pass to a photo-electric cell, where it is absorbed and produces another electric current which is passed through another G. Under suitable conditions it can be arranged that extremely minute deflections of the mirror of the first G. produce comparatively large changes of current in the second, and the only limit to the overall sensitivity is set by random deflections of the mirror of the first instrument. These are caused by impacts of air molecules with it, the impacts with one side being sometimes more violent than with the other. If a high sensitivity is not required the coil of a moving-coil G. may be mounted upon a pivot instead of being suspended, and the mirror and beam of light can be replaced by a pointer moving over a scale. This provides a more robust instrument suitable to many needs. The whole of the current that is to be measured may be passed through

the G., or, if the current is larger, a shunt may be provided. This consists of an alternative path by which part of the current may by-pass the instrument, while a constant fraction passes through the G. itself and is measured. The G. is thereby converted into an ammeter suitable for the measurement of larger currents, and may be provided with a set of shunts, by a suitable choice of which almost any current can be measured. Alternatively a high resistance may be connected in series with the G. The current through it then varies directly as the voltage applied to the resistance and G., so that the movement of the pointer is a measure of the voltage; the instrument then functions as a voltmeter.

String Galvanometers.—Neither of the above types of G. is suitable for use with rapidly changing currents, because the movements of the suspended magnet or coil take place slowly. The string G. fills this need. A fine silvered quartz fibre is stretched taut in a strong magnetic field and at right angles to its lines of force. The current passes along the fibre by way of its metallic coating, and causes a deflection by the bending of the fibre. This deflection is viewed or photographed with the aid of a microscope focused on the fibre.

Ballistic Galvanometers.—When a current is suddenly passed through a moving-coil or moving-magnet G. the coil or magnet is set in motion and, if no arrangements were made to prevent it, would swing backwards and forwards sev. times before settling down at the steady position corresponding to the current. In practice means are usually provided for damping the motion—that is, for making it die away rapidly. The damping of a moving-coil G. may be achieved by winding the coil on a closed metal frame, or by connecting a suitable resistance across its terminals; currents are then induced in the frame or in the coil and resistance, and as the energy for these currents is derived from that of the swinging coil the motion quickly dies away. The motion of the suspended magnet of the other type of G. may be damped by the friction between the air and moving vanes of mica attached to the magnet system. Sometimes, however, the damping is deliberately reduced to a small value, and the G. is then said to be a ballistic G. Such an instrument is useful for measuring the passage of small charges of electricity instead of constant currents, for if a charge is passed through it and the flow ceases before the coil or magnet has moved appreciably from its zero position, the amplitude of the first swing varies directly as the charge. The G. can therefore be calibrated to measure directly the magnitude of the charge that passes when, for example, a condenser is discharged through it.

Alternating-current Galvanometers.—Special arrangements must be made if the current to be measured is an alternating one. One method of doing so is to pass the current through a fine wire enclosed in an evacuated bulb. A thermocouple junction is attached to the middle

of the wire, and is heated when current passes. A direct current is thus produced by the thermocouple, and if passed through an ordinary G. serves as a measure of the alternating current. See A. Gray, *Absolute Measurements in Electricity and Magnetism*, 1921; D. J. Bolton, *Electrical Measuring Instruments and Supply Meters*, 1923; and E. W. Golding, *Electrical Measurements and Measuring Instruments*, 1940.

Galveston, port of entry and cap. of G. co., Texas, U.S.A., on G. Is. (N.E.), at the mouth of G. Bay. Next to New Orleans it is the most important port on the gulf of Mexico, and trades with Great Britain, France, Cuba, Mexico, and Brazil. Its harbour, which is the best in the state, has over twelve feet of water on the bar at low tide. The chief export is cotton, others are grain, timber, cattle, hides, oil-cake, petroleum. There are iron foundries, machine-shops, cigar factories, grain elevators, and manufs. of flour, ice, rope, bagging, cotton-seed oil, cotton-cake, etc. There are regular steamship sailings to all parts of the globe. It is a Catholic bishop's see, and has sev. academies. Settled in 1837, it was captured by the Federals (1862), and retaken by the Confederates (1863). A fire in 1885 caused much destruction, and worse havoc was wrought by a storm and influx of the sea (1900). Precautions against a similar disaster include a 44 m. sea-wall, and raising of the city's level. Pop. 60,800.

Galvin, George, see LENO, DAN.

Galway: 1. Maritme co. of Connacht, W. Eire, bounded W. by the Atlantic (coast much indented); S. by Clare co.; S.E. by Tipperary, Lough Derg, and the Shannon; E. by Offaly and Roscommon; N. by Roscommon and Mayo. Among the is. off the coast are Inishbofin, Inishark, Gorumna (N.W.), and the Aran Is., which form a natural breakwater at the entrance to G. Bay (about 20 m. broad) between G. and Clare cos. (S.W.). The surface is mountainous in the W., with the Twelve Pins group and the Mamturk Mts. (over 2300 ft.). The Slieve Baughta (Aughty) Mts. come further S. G. contains Lough Corrib and part of Lough Mask. The chief rvs. are the Shannon and its trib. the Suck, the Black, and the Clare. There are wild moorland tracts in the W., such as Joyce's Country, Connemara (noted for marble), and Iar-Connaught. A branch of the Grand Canal connects the Shannon harbour with Ballinasloe. Agric. produce, wool, and marble are the chief exports. Limestone is plentiful, and copper ore is found at Roundstone (S.W.). Area 2293 sq. m. Pop. 165,100. 2. Cap. of above, parl. bor. and seaport on G. Bay, 115 m. W. of Dublin, at the mouth of the Corrib. Claddagh vil., the fishermen's quarters, is close by. Coarse linens and stockings are the chief manufs., and kelp on the coast. G. is the seat of a Rom. Catholic bishop. Queen's College (founded about 1845) was renamed Univ. College (1908). Pop. 20,400. See J. Hardiman, *History of the Town and County of Galway*, 1820.

Gama, Vasco da (1469–1524). Portuguese navigator, b. at Sines, in the prov. of Alentejo. He early estab. a reputation as a fearless sailor, and followed closely in the footsteps of Prince Henry of Portugal. In 1497 he was despatched with three vessels to attempt to round the Cape. With incredible difficulties to face he at last succeeded in doing so, and continued his journey across the Indian Ocean to Calicut. Here he estab. a settlement, but owing to the hostility of the natives had great difficulty in cutting his way out of the harbour. He returned to Portugal in 1499, and was raised to the nobility. At the same time an expedition was despatched to plant a Portuguese colony at Calicut, but the atrocities of the natives caused G. to be sent out there again. He estab. a number of stations on his way there, and finally returned with rich booty to Portugal in 1503. It was not until 1524 that his services were again required. The atrocities at Calicut had again become excessive, and G. was again despatched. He succeeded in restoring Portuguese prestige, but on the way back he d. at Cochin. See G. Correa, *The Three Voyages of Vasco da Gama and his Vicereignty* (Hakluyt Society), 1869; R. W. Major, *Discoveries of Prince Henry of Portugal* (1868–77); The *Lusadas* of Camoens; and Castan Leda, *História do Descobrimento da Índia* (1551), largely based on MSS. of Álvaro Villho – a trans. of which MSS. by Ferdinand Denis is to be found in E. Charton's *Voyageurs Anciens et Modernes* (vol. III., 1855). See also E. G. Ravenstein (trans. and ed.), *Journal of the First Voyage of Vasco da Gama*, 1898; K. G. Jayne, *Vasco da Gama and his Successors*, 1910; and J. P. Alaux, *Vasco da Gama ou l'épopée des portugais aux Indes*, 1931.

Gamaliel (d. 52), a Pharisee. According to the accounts of the life of St. Paul in the Acts of the Apostles, he was the teacher of that saint. He was a well-known and influential member of the Sanhedrin. He was the grandson of Hillel. As a member of the school of Pharisees he was more tolerant, peaceful, and broad-minded than the other members. He had a great liking for Gk. and studied well that language and the manners and customs of the people. He does not seem, on any reliable authority, ever to have been inclined towards Christianity, except for his defence of Sts. Peter and John (Acts v. 31). The stories which we find nowadays to that effect are the aftermath of the influence of Paul.

Gamba, Viola da, see VIOLE.

Gambetta, Léon Michel (1838–82), Fr. statesman, b. at Cahors, being of Jewish-It. extraction. He became a member of the Paris Bar and sprang into notoriety almost immediately. He advocated very Liberal ideas, and was in 1863 elected as deputy both for Marseilles and for Belleville by the ultra-extremist party. He was largely instrumental in causing the proclamation of the republic after the disaster of Sedan. In 1871 he founded the newspaper *La République française* in an effort to strengthen the new republic. The provisional gov. which was

formed to conduct affairs after this defeat was largely under his influence, and he held the portfolio of the Ministry of the Interior. He conducted the defence of Paris, but after the beginning of the siege he escaped from Paris by means of a balloon, and conducted the war from outside. He struggled on bravely to the end, and was bitterly opposed to any surrender, and he was finally repudiated by the Fr. provisional gov. and fled to Spain. He was soon, however, elected as a deputy, and from 1872 onwards he took his place as the leader of the Republican party, putting forward an advanced programme for them. He was instrumental in preventing the attempted royalist restoration under the duc de Broglie in 1877, and quarrelled very badly with President MacMahon. For making statements about MacMahon which were held to be libellous he was arrested and imprisoned, but finally his popularity was so great that he gained practically a victory over the president, who resigned. In 1878 he became president of the Chamber of Deputies, and two years later Premier. His revision of the constitution was, however, rejected, and he retired. He d. two years later as the result of a pistol accident. His *Discours et plaidoyers politiques* were pub. 1881–85 and *Dépêches circulaires, décrets*, 1886–91. See J. Reinach, *Histoire du ministre Gambetta*, 1884; F. Laur, *Le Cœur de Gambetta*, 1907; and H. Stannard, *Gambetta and the Foundations of the Third Republic*, 1921; and Lives by P. Deschanel, 1919, and P. Matter, 1923.

Gambia: 1. Riv. of W. Africa, flowing for about 1000 m. through Fr. Guinea, Senegal, and the G. It discharges into the Atlantic at Bathurst through a deep estuary. Light craft can ascend as far as the Barraconda Rapids, 350 m. from the estuary, and about 150 m. further when the riv. is in flood. 2. Brit. crown colony and protectorate on W. coast of Africa. It extends for about 250 m. along each bank of the R. G. and its area, including that of the parts of the colony administered as a protectorate, is 3099 sq. m. The Fr. have been given access to the navigable parts of the riv. The chief tn. is Bathurst, on the is. of St. Mary. Bathurst, together with Georgetown and some adjoining land and is., forms the colony proper, which has an area of 69 sq. m. and a pop. of 14,000. The remainder of the ter. constitutes the protectorate. The country consists largely of creeks and swamps. The protectorate contains four provs., each under a commissioner who is responsible to a senior commissioner for the protectorate, who is, in turn, responsible to the governor. By an ordinance of 1916 the Kombo St. Mary Div. was subtracted from South Bank Prov. and added to the colony. The executive council consists of the colonial secretary and four other ex-officio members, namely, the r. s. r. g., attorney-general, senior medical officer, and the senior commissioner. The legislative council consists of the governor as president, the colonial secretary and five

officials (viz. the four executive council members plus the commissioner of the colony), and two unofficial members. There are sev. elementary and secondary schools run by the gov. and the church. Internal communication is maintained by steamers or launches; there are no local railways. Bathurst is connected with St. Vincent and Sierra Leone by cable and with the in. in the protectorate by wireless. The prin. exports are ground-nuts, hides and skins, and palm kernels; the prin. imports are tobacco, wines, sugar, tea, soap, oils, metal, cotton goods, boots and shoes, coal, etc. Bathurst is fortified, and the chief Brit. naval base in W. Africa. The tn. is built on piles, and considerable improvements have been effected in recent years.

G. was discovered by the early Portuguese navigators, but no settlement was made. The Brit. colony was founded purely for trading purposes, the original patent being granted in 1588 by Queen Elizabeth. Later various merchant companies obtained charters and settled along the riv. banks. From 1807 G. was controlled from Sierra Leone, but in 1843 it was made an independent crown colony. It was recognised as Brit. by the treaty of Paris, 1814. In 1866 it was included in the W. African Settlements, but was again a separate crown colony in 1888. Pop. (colony) 21,100; (protectorate) 233,100.

Gambier, James, Baron (1756-1833), Eng. admiral, b. in the Bahamas. He entered the navy and rose rapidly in its service. He served under Lord Howe in 1794, and commanded the fleet which bombarded Copenhagen in 1807. He was present with Cochrane at the battle in Aix Roads in 1809, but refusing to act on that sailor's advice was tried by court-martial and honourably acquitted. He was made an admiral of the fleet in 1830, and d. three years later. His memoirs were pub. in 1861 by Lady Chatterton.

Gambit, see under CHESS.

Gambling may be broadly defined as the playing at games of chance or wagering on some fortuitous event for money or money's worth. At the common law all games were allowed provided they were played fairly. When the legislature first intervened is not quite certain, but once having done so it classed together as illegal all sorts of games and pastimes such as cards, dice, cock-fighting, and races, without regard to the absence of any inherent common element. Perhaps the earliest instance of state interference was the proclamation issued by Edward III., who is recorded to have looked with disfavour on games of stones, bars, hand-ball, football, cockfighting, *et alios rancos ludos*, not because of anything vicious in the games *per se*, but apparently because he found that his subjects preferred such peaceful games to the 'noble sports of war.' The proclamation was therefore made, according to some historians, not out of regard for the moral welfare of the people, but in the interests of recruiting for the army. Statutory restrictions on games and gaming are to be found as early

as the reign of Richard II. The object of these and subsequent statutes has generally been to punish as public nuisances all manner of games of chance by referring the persons who play at them to the category of rogues and vagabonds. Old writers assign the quaintest reasons for this legislative interference. In regard to the later statutes against gaming and wagering, including the prohibition of lotteries, it is to be noted that the principle varied according as the statute is creating a criminal offence or merely declaring that certain contracts shall not be civilly enforceable. (As to this see also GAMING.) G. or wagering contracts are unenforceable simply because there is no legal consideration (see CONSIDERATION; CONTRACT). The principle underlying the Acts which punish certain forms of G. as indictable offences is by no means clear. As the criminal law now stands, numbers of games are expressly forbidden avowedly on the principle that they are games of chance. The Gaming Act (1845), the Betting Act (1853), the Gaming House Act (1854), the Vagrancy Act (1873), and the Street Betting Act (1906), without expressly defining gaming, strengthen the common law against the keeping of common gaming houses or betting in the streets or other public places, presumably on the common law principle that such practices are public nuisances in that they promote cheating and other corrupt practices. But the element of chance as the deciding factor is apparent in most of them. Members of a bona fide club may bet with each other at their club, and apparently betting in the streets could only be punished if any person were found frequenting or loitering in the streets or other public places for an appreciable time for that purpose (see BETTING).

Certain games are expressly made unlawful by a series of statutes: they are ace of hearts, pharaoh (faro), basset, hazard, roulette, passage, and every other game played with dice or any instrument, engine, or device in the nature of dice, having figures or numbers on it, but not backgammon or games played on backgammon tables. The prohibition is wide enough to include any card game of mere chance, and that form of baccarat called *chemin de fer* (q.v.) has been vetoed since 1895. In the celebrated case of Jenks v. Turpin (1884), where a divisional court upheld a magisterial decision which punished the playing of *baccarat banque* in a gaming-house, the only substantial argument urged against the inclusion of this game was that the element of skill consisted in the player determining whether he would stand on the card dealt to him or take another. Considerable public comment was evoked by a later decision of the courts against progressive whist drives. The principle of the decision was that the element of chance altogether predominated over that of skill, especially as after the first hands were played no player knew whom his partners were going to be for the rest of the drive, and further that weak or un-

skillful players might be indiscriminately pitted against strong players. The craze for limericks in certain pubs, was also suppressed by decisions which declared that such competitions were mere lotteries. All lotteries are public nuisances according to the Eng. law. The Lotteries Act, 1823, punishes as rogues and vagabonds persons who sell tickets or chances in lotteries authorised by foreign potentates or states, and an Act of 1836 provides penalties for advertising lotteries (*see also LOTTERY*).

There can be no two words about the popular love of G. at all times and in all countries. The periodical raiding of West End clubs and the organisation, especially since the First World War, of sweepstakes offering immense prizes are evidence of this fact (*see CALUTTA SWEEPSTAKE*). It is by analogy to the principle of betting in a club that the football pools continued to function after it was decided by the courts that the pub. of forms in the press was illegal. It seems evident that pools partake of the nature of both lotteries and sweepstakes; but the position regarding both is as obscure as it is on the licensing of bookmakers and the estab. of totalisators on race-courses; and it may be said that the law on G. is publicly flouted every day. It may be said that the G. instinct is more prevalent among the hot-blooded and oriental races. If that were not so it would be difficult to explain the absence of restrictions on such games as roulette and *belle-et-quarante* in France, Monaco, and, formerly, in Portuguese colonies, and other countries inhabited mostly by Lat. races, and in China. For time, it is true, Ostend was a serious rival to Monte Carlo, but in 1902 the Belgian Parliament suppressed public gaming, and awarded compensation to the gaming-house proprietors of Ostend. Baccarat is still prevalent in France, although strictly regulated by the clubs who play the game. The Chinese are a race of notorious gamblers, and, with them, there is curiously intermingled a strong vein of superstition.

At the present day, however, it must be conceded that even among Lat. races G. is less and less favoured by the various states, and that this disfavour has resulted in the isolation of Monaco as the one spot in Europe where the roulette whirls, not only by the sanction of the State, but for the express purpose of providing the revenue to support it, and such epithets as a 'hot-bed of vice,' 'the plague spot of Europe,' 'the pickpockets' paradise,' 'the wasters' Eldorado,' and so forth have been showered on this place. *See MONTE CARLO; ROULETTE.* *See also GAMING and under the various games, CHEMIN DE FER; TRENTÉ-ET-QUARANTE, etc.*

Gamboge, resinous gum which is procured from certain trees in Siam, Ceylon, and other tropical places. It may be used medicinally as a purgative, but cannot be used alone. It is also used for obtaining a yellow pigment.

Gambinus, mythical Flemish king who is supposed to have commenced the brewing of beer. The exact derivation of his

name is not known, but it is held to be derived from Gan Primus, who was the president of the Guild of Brewers.

Game Laws. Laws relating to the preservation of game and the punishment of persons unlawfully killing game have sunk to a position of comparative insignificance as compared with the state of things a century ago. Blackstone in his time could truly write of the offence of destroying game, that the sportsmen of England seemed to think it of the highest importance, and the only one of general and national concern. The statutes against the subject were many and various, and, as the classical commentator said, not even grammatical. Moreover, they exhibited the worst features of class legislation, for they drew broad distinctions between offenders of such rank as was called a 'qualification' (i.e. being the son and heir apparent of an esquire) and indigent offenders. Traditions, however, die hard, and the G. L. were a legacy of the repressive forest laws of the Conqueror. For centuries the one passion of the Eng. landed gentry seems to have been the pursuit of game, and no punishment was too terrible for the poverty-stricken wretch who poached to supply his needs. Even as late as 1927 an Act was passed punishing the felony of killing or wounding deer in any enclosed land with transportation for seven years. But the effect of protecting game by oppressive laws was probably more injurious to the morals of the rural pop. than any other single cause. The game swarmed before the labourer returning home from a day of unremunerative toil. Repression only led to night poaching with violent resistance to escape detection. The jails were not large enough to contain the hundreds of prisoners annually convicted. The total public expenditure which the preservation of game occasioned was probably more onerous than that which was required for the support of pauperism. The G. L. were indeed also the greatest hindrances to the improvement of agriculture; and it has often been stated that from three to five hares eat and destroy as much as would keep one sheep. The destruction by game to crops was enormous.

But public opinion has effected a great change, notwithstanding the curious anomaly that the Game Act of 1831 and most of the other repressive G. L. still remain on the statute book. Poaching is not now looked upon as much more than an escapade, and, comparatively speaking, is but lightly punished. In a word, it may be said that the milder manners of the present age, the growing humanness towards dumb animals, and the tendency to excuse offenders where no great moral iniquity characterises the offence have conspired to reduce the G. L. to a purely secondary place in the criminal system. The prin. Acts now in force are the Game Act, 1831; the Night Poaching Act of 1829 as amended by 7 and 8 Vict. c. 29; the Hares Killing Act, 1848; the Game Licences Act, 1860; and the Ground Game Act, 1880; besides certain Acts for

the protection of wild birds. Broadly speaking, these Acts have for their object the restriction of the right either to kill or sell game, and, as incidental thereto, the punishment of those who infringe that exclusive right; the provision of close seasons for birds; and the regulation of game certificates and licences. It may be noted here that these Acts, by punishing trespass as a criminal offence, and inflicting penalties on those who infringe exclusive rights of killing game, have overcome the difficulty presented by the common law principle that there could be no private ownership in animals *sewa nature* (i.e. in a state of nature) unless reclaimed or confined, or killed on one's land.

Game is declared by the Game Act of 1831 to include hares, pheasants, partridges, grouse, heath or moor game, black game, and bustards. Snipe, quail, land-rail, woodcock, and cootes are not game, but they may only be taken or killed by certificated persons. Woodcock and snipe may be taken with nets or snares, and also rabbits, by the proprietor in an enclosed ground or by a tenant and his servant. The right to the game is vested in the tenant in all cases where it is not reserved to the landlord in his agreement with the tenant. Where the game is reserved the occupier can neither kill game nor give permission to another to do so.

Poaching or trespassing on the lands of another in search of game is, if committed in the daytime, an offence punishable summarily under section 30 of the Game Act, 1831, by a fine not exceeding £2. Trespassers may be required to quit the land, and give their names and places of abode, and in case of refusal may be arrested. Firing at game from a highway is a trespass in pursuit of game. The leave of the occupier of the land is no defence where the game belongs to the landlord or some other person, unless given prior to the trespass. These provisions do not apply to persons hunting, or coursing, or exercising a right of free warren, nor to gamekeepers. An information for trespass may be laid by a common informer. Trespassers to the number of five or more acting together are liable to a penalty not exceeding £5. The law is more severe against poaching by night. Under the Night Poaching Act, 1829, as extended by an Act passed in 1844, any person unlawfully (i.e. having no certificate or licence) taking or destroying any game or rabbits by night, in any land open or enclosed, or on public roads or highways, gates, paths, outlets, or openings between such lands and roads or paths, or leading to enclosed gates; or any person either entering or being by night in such places, with any gun, net, engine, or other instrument, for the purpose of taking or destroying game, may be summarily punished for the first offence with imprisonment not exceeding three months, and at the expiration of such period be bound over for a year; for the second offence the above periods are doubled; and for the third or subsequent offence penal servitude may be awarded

to the extent of seven years. Under the same Act as similarly extended to public highways and gates by the Act of 1844, if three or more persons by night unlawfully enter, or are on any land for the purpose of taking or destroying game or rabbits, any of the party being armed with firearms or other offensive weapons, they shall be guilty of a misdemeanour punishable by penal servitude to the extent of fourteen years. The Poaching Prevention Act of 1861 gives power to a constable to search persons in public places whom they have good cause to suspect of coming from any land where they have been unlawfully engaged in pursuit of game; they may also search any cart or conveyance of the suspects, and seize game, guns, nets, and engines. By an Act passed in 1862, unlawfully taking or killing hares or rabbits in warren by night is punishable as for a misdemeanour; the punishment for the same offence committed in the daytime is a fine of £5. Unlawfully coursing, hunting, or killing deer in an unenclosed part of a forest is punishable by a penalty not exceeding £50 for a first offence, and, for a second offence, imprisonment not exceeding two years, which latter punishment also applies to a first offence where the deer were on any enclosed land. Strong measures to prevent trespassing or poaching may doubtless be adopted, but setting spring-guns, man-traps, or other engines calculated to destroy life renders the person so doing liable to penal servitude to the extent of five years.

A licensee is required by every person who hunts or takes game, except persons (in Great Britain) taking woodcock or snipe with nets or springs; proprietors or tenants on enclosed land killing rabbits; persons hunting deer or hares with hounds; and others. Occupiers of enclosed land, or owners, having the right to kill game, may themselves kill hares, or authorise others to do so, without a licence, but such authority must be limited to one person at a time in any one par., and must be registered with the clerk of the petty sessions' justices. A gun licence is required even when the quarry is not legally game; but a game licence covers a gun licence. The charge for a licence taken out after July 31, to expire on the next July 31, is £3; to expire on Oct. 31 next ensuing, £2; for a licence taken out after Nov. 1, to expire July 31, £2; and for any continuous period of fourteen days, £1. See also CLOVE TIMES.

Gamelin, Maurice Gustave (b. 1872), Fr. general, educated at St. Cyr. Chief of staff to Gen. Joffre in the First World War from 1914 to 1916. General of brigado and a divisional commander in 1917. Led a military mission to Brazil, 1919-25. General of div., 1925. Commander of the Fr. forces in the Levant, 1925-28. Chief of staff of the Fr. Army, 1931-35. Inspector-general, 1935-37. Vice-president of Higher Council of War, 1935. Chief of general staff of national defence, 1938. Commander-in-chief of the allied forces in France in the Second World War, 1939. Of 'Maginot' mentality. Sustained a colossal defeat by the

Gors, in June 1940. He was one of the defendants at Riom in a trial for treason and in 1943 was imprisoned. His book, *Servir : Les Armées françaises de 1940* (pub. in 1946), is his defence against charges of having contributed to the disaster of 1940, and he is at pains to show that he had done his best to rearin France and had not failed to explain to his officers what the nature of the coming attack would be. His position was difficult: he was chief of staff of national defence and commander-in-chief of all Fr. land forces; but Gen. Georges was commander-in-chief of the Fr. and allied forces in N.E. France. G. gave Georges too free hand and for too long. Finally, on May 19, 1940, he intervened with an order that the First Army Group should counter-attack the S. flank of the Ger. salient. A few hours later G. was replaced by Weygand, who, in consequence, has been thought to have given the order; but in any case it was never carried out. As chief of staff from 1938 it fell to G. to recommend equipment for the Fr. Army and air force and to mould army training to doctrine, and also to provide against the most likely form of attack. He defends himself effectively on all these counts. It is evident that he was not the advocate of "ce first that he has been assumed to be; that was the doctrine of Pétain and his group, which included Weygand and Georges. G. understood and preached the theory of *Blitzkrieg* and the importance of armour and the air; and he also fully understood that the Montmédy-Sedan sector was the point most likely to be attacked. But he is less convincing in his defence of Fr. military equipment; though the Fr. War Office, was never allowed adequate funds. In 1935 G. had to abandon a project to prolong the Maginot line (q.v.) to the Escout (Scheldt) because it had become more urgent to spend money on tanks. The neglect of anti-aircraft artillery was in part the result of policy. The decision to advance into Belgium has been criticised in France, but G. defends it effectively. The actual break-through of the Ger. Army was due to the collapse of Corap's Fr. Ninth Army, which left a 60-m. gap between the Ardennes Canal and Namur. On its right Huntziger's Second Army did a little better, but lost Sedan. G. maintains that Georges should and could have had more reserves available to reinforce both Corap's and Huntziger's armies, and in any case their divs. were short of anti-tank guns, while too high a proportion of their men were second-line troops and older than the average. G. puts the blame for all these matters on Georges, and perhaps it is true that G. was up against a heavy weight of apathy and covert opposition; but it seems inconceivable that any Brit. or Russian commander-in-chief would have held the reins with so lax a hand during a battle on which his country's survival depended.

Game Reserve is the term applied throughout the Brit. Empire to large tracts of country which have been set aside or reserved by the var. govs. in order that the wild life of the particular ter. may

be protected against extinction, likely to be brought about by the predatory instinct of man and the spread of civilisation. In the old days the term was applied to reserves in England which were delimited in the first place for the king so that within these reserves game should be encouraged and preserved in order to provide pleasure for the royal hunt. In recent times, however, the original purpose of the G. R. has been reversed and the modern G. R. has been set out not as a measure against 'indiscriminate' killing of the game, but as a means of preserving the wild life of the locality against total extinction. Large tracts have been set aside in N. America, Australia, Africa, and Malaya. In Canada the Dominion Gov. maintains a number of wild animal parks which are administered by the National Parks branch of the Dept. of the Interior. These are the Buffalo and Elk Is. Parks in Alberta, noted for their herds of buffalo, and the Nemiskam Park, also in Alberta, which is a sanctuary for prong-horned antelope. In these parks the hunting of game is forbidden, and the wild life resources preserved. There are also other parks not included in the G. Rs., of which the most important are the Algoma Park in Ontario, and the Laurentides Park in Quebec.

In the U.S.A. the movement of G. Rs. (or game preserves as it is here known) has been actively pursued, and large tracts of ter. embracing sev. thousands of square miles have been set aside for the preservation of wild animal and bird life. The Yellowstone Park is the most important wild animal and bird sanctuary in the U.S.A.

Gamete, biology, the sexual protoplasmic body, which unites with another for reproduction. Typically Gs. consist of the ovum, a large cell containing nutritive material, and the spermatozoon, smaller and frequently active. The individual bearing the former is the female, the latter the male. See **BIOLOGY**.

Gaming. A wager or G. transaction involves a promise to pay money or something of value solely upon the determination of an uncertain event. The policy of the Eng. law is to render practically all such agreements unenforceable, the only substantial exceptions being the various commercial transactions relating to insurance and the purchase of shares on the Stock Exchange. The Gaming Act of 1845 makes all G. or wagering contracts null and void. By the Gaming Act of 1920 no one can recover under a contract in any form commission or reward promised him for making or paying bets on behalf of another. The effect of this Act is that if A employs B, a betting commissioner or turf agent, to make bets for him and loses, B cannot recover from A money paid to discharge such bets; again, if A obliges his friend B by paying his racing debts, he cannot recover the money from B; and again, if A lends B money, knowing that B is going to make bets with it, he cannot recover from B the money so lent. But if A makes bets for B and receives the winnings he can be compelled

to pay them over to B; and, again, if A deposits money with B, a stakeholder, he can recover it from B at any time before B has actually paid it away on the determination of the wager. Securities such as promissory notes or bills of exchange given in payment of a bet are void as between the original parties to it, and a subsequent holder even for value cannot enforce such an instrument if it be shown that he knew of the illegal consideration for which it was originally given. Speculating on differences in the Stock Exchange falls under the Act of 1845 where it can be shown that the contract was a 'time bargain,' or mere gambling transaction (see DIFFERENCES). Contracts of marine insurance are perfectly valid where the person effecting the insurance had an *insurable interest* in the subject matter of the policy at the date of the loss; the result of this is that a cargo owner may recover on a policy entered into many days after his cargo has been lost at sea provided he was ignorant of such loss at the time he made the contract. See under INSURANCE. For the Acts forbidding certain games as criminal offences, see under GAMBLING; and for the prohibition of lotteries, see GAMBLING and LOTTERIES. See C. F. Shoolbred, *Law of Gaming and Betting* (2nd ed.), 1935, and H. A. Street, *Law of Gaming*, 1937.

Gamma Rays (γ rays). Radioactive substances emit three kinds of 'rays', named α , β , and γ . The first two radiations consist of material particles, but γ rays are electromagnetic radiations identical in character with light, wireless waves, and X-rays, but of wave-lengths of the order of 10^{-10} cm.; indeed they are the shortest electromagnetic waves known at present. G. R. are more penetrating than X-rays because of their shorter wave-lengths, and are used to cure deep-seated cancers.

Gamut, set of notes in a musical scale which number eight, and which form an octave. In old notation the G. refers to the lines or spaces on which the notes are printed.

Gandak, see GHENT.

Gandak: 1. Great G., an Indian riv. which rises in the Himalayas in Nepal, and is a trib. stream of the Ganges, joining that riv. at Patna. Its length is about 400 m., and it is known also as the Narayani. 2. Little G., a riv. which rises in the hills of Nepal, and which joins the Gogra at Sunaria. It is called also the Gunduk.

Gandersheim, auct. tn. in Brunswick, some 50 m. from the tn. of that name. Its abbey made it famous for some centuries; it was used as a place of education for the daughters of nobles. Pop. 2700.

Gandharvas, one of the bands of semi-divine beings created in the beginning by Brahma. They were 6333 in number, and were b. 'imbibing melody.' There are different accounts of their origin. In later myth they are met with as the musicians of Indra's heaven, espoused to the Apsarases (nymph-like beings). They have been identified with the Centaurs.

Gandhi, Mohandas Karamchand (1868-1948), Indian Nationalist leader, was b. Oct. 2 at Porbandar, in the Kathiawar peninsula, on the coast of the Arabian Sea. His parents were of Bania caste and Jain religion. In boyhood he went through a period of atheism, out of which he came, by the help of such authors as Tolstoy and Edward Carpenter, into an ethical dogmatism that caused much trouble to himself and his countrymen. At twelve he was married, and his marriage was happy. In 1888 he arrived in England; he studied at the Univ. College, London, and was called to the Bar at the Inner Temple. He returned to India in 1891, and soon afterwards began practice in the supreme court of Bombay. In 1893 business took him to Pretoria. He resolved to stay in S. Africa to support the cause of Asiatic immigrants, and he obtained a lucrative practice in Johannesburg, but gradually came to consider his profession immoral. In 1899 he organised an Indian Red Cross for the Boer war. In 1903 he founded a paper, *Indian Opinion*, at Durban. In 1904 he instituted a hospital in Johannesburg when plague broke out, and he was prime mover in the great demonstration there, Sept. 11, 1906, whereat the oppressive 'Asiatic ordinances' were denounced. During the native revolt in Natal in 1908 he organised, and served in, a corps of stretcher-bearers. For his political activities he was frequently arrested and imprisoned; even from extremists on his own side he suffered violence. The oppressive ordinances were removed in 1914; G. returned to India, and on the outbreak of the First World War came to London to organise an Indian ambulance corps. The attitude of the Brit. Gov. in India after the war entirely alienated him. He was the religious leader of the national movement till Tilak's death in 1920; he then became political leader by necessity. He proclaimed the *Hartal*, or cessation of work, of April 6, 1919, which was the precursor of the affair of Amritsar (q.v.). He took advantage of Moslem unrest provoked by the Allies' treatment of Turkey; and their Khilafat Committee, 1920, endorsed his non-co-operation policy. It was, like Sinn Fein in Ireland, an ignoring of the Brit. Gov. although it did not yet involve withholding taxes. The All-India Congress of Calcutta in that year approved the policy, which included the fostering of home industries, such as the use of the spinning-wheel.

In Nov. 1920 G. founded the National Univ. of Gujarat at Ahmedabad. The non-co-operation policy, of course, did not pursue the quiet course indicated by G.'s ethics. Strikes and riots were widespread in 1921 and, in the same year, G. superintended the burning of foreign merchandise in Bombay. 'Civil disobedience,' the next step, involved non-payment of taxes - it began in Nov., when the Prince of Wales arrived. There was rioting and looting, so G. suspended the disobedience order. At the end of the year Congress invested him with dictatorship. More violence by Nationalists (at Gorakpur)

caused G to abandon civil disobedience, but he was arrested and tried at Ahmedabad in 1922 and sentenced to six years' imprisonment for preaching disaffection. After an operation for appendicitis in prison he was released (1924) but for a while suffered eclipse. Near the end of 1927 his fame revived—he was enthusiastically received in Ceylon. After a visit to Burma he was in Aug. elected to presidency of Congress but he declined it, leaving it to his lieutenant Motilal Nehru (d. 1931). In March and April 1930 he made his celebrated march from Ahmedabad to the sea and formally violated the unpopular salt monopoly of the government.



MAHATMA GANDHI

publicly distilling salt from sea water on the shore. He was arrested May 1930 and sentenced to be kept in Yeravda Jail near Poona during the gov's pleasure. He was released again in Jan 1931 to attend the Round Table Conference in London. Two months later he concluded a truce with Lord Irwin the viceroy. During further unrest in 1933 he was once more arrested and again released. The following year he left the National Congress saying that he wished to give up politics but in fact he merely retired to a villa in the Central Provs where he closely observed developments and retained his position as the most influential figure in the Nationalist movement. He now seemed to show a tendency to favour the right wing group of Congress and directed his influence in a manner which was opposed to the views of Jawaharlal Nehru (q.v.), the Socialist Congress leader. He entered public life again in 1937 when he acted as mediator between the gov and the Congress party on the issue of the assumption of office by the party in the provs.

On the outbreak of the Second World War it seemed at first that G would advise the Congress party to lend their moral support to the nations resisting aggression. But he convinced himself that only a 'free India' could render effective moral support to Britain, and his demand for 'complete independence' became even more insistent. When Japan invaded India he became much perturbed at the defence measures which the Govt of India set in motion. At this time discussions on the Cripps Mission (see *India History*) had reached a hopeful stage but G threw his weight against settlement and the negotiations with Congress leaders broke down. At a moment when the war situation was unfavourable he spurned the draft declaration whereby India was promised autonomy and demanded that the Brit should quit India that the Indian Army should be disbanded and that Japan should be allowed to enter India and arrange terms with a non-resisting people.

In Aug 1942 he concurred in the decision to strike the blow of mass obstruction against the war effort. This 'Quit India' as he himself called it led to his arrest and that of other Congress leaders and to widespread disorder and bloodshed. G was interned in the Aga Khan's palace at Poona and forbidden political contacts though he was allowed the company of Mrs. Gandhi who d. in Feb 1944. He was released unconditionally on medical grounds on May 6 1944. Subsequently all the Congress leaders were released to take part in the protracted discussions arising out of attempts to end the strife between Hindus and Muslims over the Pakistan (q.v.) issue. A series of conferences between him and Mr. Jinnah (q.v.) at the latter's house in Bombay were fruitless, for G stated that he spoke only for himself and had no mandate from the working committee of the Congress. For many years in fact he had withdrawn from actual membership of the party, only to dominate it from without. In the negotiations in the spring of 1946 at Delhi with the historic Brit Cabinet mission under Lord Pethwick Lawrence, G took a large share mainly behind the scenes and when at length amid very serious outbreaks of communal violence, the plans of the mission led to the formation at Delhi of an interim National Govt with Motilal Nehru as vice president of the council, G remained outside the Cabinet much to the relief of its members. Yet no major decision could be taken at the centre or by the prov. govt without full deference to the wishes of the Mahatma the idol of the Hindu masses.

When Independence Day came in 1947 sanguinary unrest in Calcutta led to fears that the partition of Bengal between the new dominions of India and Pakistan would have disastrous consequences. G, who had been travelling through E. Bengal and in Bihar preaching brotherhood, went to Calcutta and in Sept undertook another fast until normal conditions were restored. The party

leaders exerted their influence over the people and on the fourth day G.'s fast ended. Thus he 'miraculously' succeeded where armed force had failed. This success encouraged him to stage in Delhi early in Jan. 1948 his fifteenth fast in the hope of bringing harmony between India and Pakistan. The fast began as the Security Council at Lake Success (U.S.A.) was considering the Kashmir and related problems between the two dominions. This fast ended on the fifth day through the Delhi Cabinet's decision on G.'s advice no longer to withhold from the Pakistan Gov. payment of the £41,000,000 due from the undivided cash balances at the time of the Brit. withdrawal. On Jan. 30 he was assassinated in Delhi on his way to an evening prayer meeting by a Hindu fanatic named Nathuram Vinayak Godse. The trial of Godse, together with others implicated in the murder, began on May 27, 1948 and ended on Feb. 10, 1949. Godse and his associate, Narayau Apte, were found guilty of the murder and of conspiracy to murder and were sentenced to death, while five other persons were sentenced to transportation for life for conspiracy to murder.

As a social reformer G.'s personality and purpose excited the widest interest throughout the world. More than a politician, he long figured as a prophet in revolt against the ideas of an age of machinery, of science, of more complex organisation, and of ever-increasing state control. But the Congress, of which he became leader in the campaign for *swaraj* or self-government for India, was mainly dependent for finance upon Indian big business, and the repudiation of W. methods was seldom preached by him after his first civil disobedience movement in 1919. Often as he seemed to change his mind on matters of detail, and adept as he was in political expediency and tactics, the burden of his message was the same, the repudiation of violence and the exaltation of the individual conscience. Fundamentally this part of his doctrine was a conviction, based, in his belief, on the purest forms of Hindu religion, that the innate goodness of the common man was the essence of all sacred and political organisation. This was in later years the inspiration of the campaign against 'untouchability' which lost him a multitude of supporters among the orthodox. A pacific individualist, whom millions of his countrymen revered as a saint and whom all respected as the embodiment of tradition, G. was not a man of commanding gifts nor an orator, nor did he make any real constructive contributions to the solution of constitutional problems. He was in fact a perpetual enigma both to admirers and critics. If he was certainly a propagandist versed in all the arts of publicity, Hindu India either held that his guidance was infallible, though difficult to follow, or pleaded his saintliness and the imperfections of his human instruments in mitigation of his manifest errors. Muslims, however, soon became less acquiescent. His European and Amer. admirers were few by comparison

with the many who were puzzled or irritated by the frequent contrast between the humorous, kindly, and courageous social reformer and the headstrong demagogue, who could split hairs with any sophist. But he was the most influential figure India has produced for generations, though it must be left to posterity to determine precisely how much the eventual triumph of *swaraj* owed to G. and how much to the inevitable development of Brit. policy in the government of dependent peoples from the era of Burke to the modern application of the concept of dominion status as the goal of the free and equal partnership which is called the Brit. Commonwealth of Nations. See R. Rolland, *Mahatma Gandhi*, 1921; C. F. Andrews, *Mahatma Gandhi's Ideas*, 1929; E. Privat, *Aux Indes avec Gandhi*, 1934; K. Shridharani, *War Without Violence*, 1939; C. Heath, *Gandhi*, 1944; and G. Catlin, *In the Path of Mahatma Gandhi*, 1948.

Gandia, Sp. seaport in the prov. of Valencia, nearly 40 m. S.E. of the th. of that name. The chief exports are oranges, raisins, wine, onions, and tomatoes. Pop. 13,000.

Gando, or **Gandu**, native state in N. Nigeria (Brit. protectorate). The natives belong to the Fulani race. The chief tn. is G. The total area is about 80,000 sq. m.

Gandzha, or **Ganja** (formerly *Elizavetpol* or *Ye lizavetpol*): 1. Former gov. in Transcaucasia, Russia, extending from the Caucasus to the Iranian border; now part of Azerbaijan. 2. Tn. of Azerbaijan, S.S.R. A grain centre. Also trades in wine and copper. Pop. 85,000.

Ganesha, or **Gana-pati** (i.e. Lord of Hosts), name of a Hindu God, the son of Siva. His images represent him as a stout man with an elephant's head and four arms.

Ganges, riv. of N. India. This great stream is formed by the draining of the S. slopes of the Himalaya Mts. It rises in the Garhwal state and issues from an ice cave of the Himalayas, near Gangotri, 10,000 ft. above the level of the sea. The riv. when it first issues forth is called the Bhagirathi. It is not until it is united with the Jalsari and the Alakananda that the united stream is known as the G. The G., besides being the great riv. of India, is also an essential part of the Indian religious system. Both the source and the junction of the rivs. are regarded as sacred spots by the Hindus. Emerging from the Himalaya Mts. it turns to the S.W. It can hardly, however, be regarded as a great riv. until at Allahabad it receives the Jumna, a stream which has its origin to the W. of the G. The junction of the Jumna and the G. is regarded by all Hindus as the holiest and most sacred of places, and is the scene of constant pilgrimages by the Hindus, who come there to wash away their sins. Other trib. of the G. are the Gyanti, Gandak, and Gogra. Opposite the confluence of the Gandak is the city of Patna, 140 m. E. of Benares. The riv. passes through the great city of Benares and then approaches the bay of Bengal; 220 m. before reaching

the shores of the bay it begins to spread out and form the delta. The main channel, which is called the Padma or Padda, flows in a south-easterly direction, and is met at Goalanda by the main stream of the Brahmaputra, and these two streams form a great estuary which is known by the name of Neghka, and which enters the bay of Bengal at Moanhall. This great channel is the most easterly of all the channels of the delta. On the other side we find the Hugli, which is the most westerly of all the channels. The land which goes to form the delta is in the N. fertile and rich, but in the S. is swampy and goes by the name of the Sundarbans. The great commercial stream of the delta is the Hugli, on which stands the tn. of Calcutta, which is about 90 m. from the sea-coast. Formerly steamer communication existed as far as the tn. of Allahabad, but nowadays, owing to present-day facilities for traffic by rail and the increasing shoals in the riv., steamers go no further than Calcutta. Often great changes take place in the riv.-bed; i.e. are thrown up, new channels are sought. Such changes are so rapid that it is dangerous for any large or permanent structure to be erected on its banks. The G. is crossed by six railwa. bridges as far as Benares and another in E. Bengal has been erected. There are two canals—the Upper G. Canal and the Lower G. Canal—which together with the Jumna irrigate the greater portion of the land between the G. and the Jumna above Allahabad. There is no important navigation on them.

Ganges Canal, constructed mainly to irrigate the arid country between the G. and the Jumna Rs.; originally extended from Hardwar to Cawnpore and Etawah, but later it was much enlarged and at present has a total extent (including branches) of 3700 m., of which 500 m. are navigable. It has greatly conduced to the mitigation of distress caused by famine.

Ganglion (Gk. γαγγλιον, swelling or exrescence): 1. In anatomy an enlargement occurring in the course of a nerve, and containing bi-polar or multi-polar nerve cells in addition to nerve filaments. Two systems of nerves have ganglia upon them. First those of common sensation, whose ganglia are near to the origin of the nerve in the spinal cord. Secondly the great sympathetic nerve which has various ganglia on various parts of it. In the invertebrates these ganglia are centres of nervous force and are distributed through the body in pairs. The cerebral ganglia of vertebrates are the brain itself, the masses of grey matter at the base of the brain, as the optic thalamus, etc. 2. In surgery an encysted tumour, situated somewhere on a tendon. 3. In botany the mycelium of certain fungals. Lymphatic G.—a lymphatic gland.

Gangotri, Hindu temple and place of pilgrimage in the Himalayas, on the r. b. of the Ganges. It dates from the eighteenth century, and the pilgrims to this temple are supposed to be relieved of their sins.

Gangpur, state of Orissa Agency, India. Area 2484 sq. m. Pop. about 400,000.

Gangrene (Gk. γάγρης), or Mortification. G. is the condition in which putrefaction accompanies the death and degeneration of body tissues or of some of their constituent cells and arises from an interference with the blood supply. The part affected may be either dry, that is mummified, or moist, the amount of moisture depending upon the degree in which the blood supply is cut off. The cause of G. may be local, constitutional, or the two combined. It may be the result of changes in the vessel wall, as in senile G. of the old and feeble, and in certain diseases, such as diabetes, typhoid, measles, etc. Blocking of the vessels is another cause, for example in the lungs or other parts, from pressure or changes whose ganglia are near to the origin of the nerve in the spinal cord. Secondly, outside the vessel. Heat or cold (burns or frostbite), chemical agencies and bacillary affections, such as carbuncles, erysipelas, etc., may all bring G. in their train. Since the use of antiseptics has become general, traumatic and hospital G. are comparatively rare. During the First World War conditions were frequently such that it was impossible to pay immediate and constant attention to wounds and G. not infrequently supervened. Antisera effective against germs causing G. and other dangerous diseases are now injected, and the wounds, cleansed with antiseptics, are kept open until they are completely drained and show no sign of discharge or inflammation. Dead and injured tissues are removed, and the wound is reopened if any inflammation appears. If the disease shows any indication of spreading, amputation well above the limit reached by the G. is the only means of preserving life. The pain and extent of the G. depend upon the cause and its persistence. When the cause is removed the gangrenous dead parts dry up and separates.

Treatment.—During the separation the affected parts should be kept aseptic, surgically clean, and free from germs. The patient's strength should also be kept up by good nourishing food. In G. of a limb amputation is indicated when there is no prospect of a return of healthy blood to supply the part affected.

Ganja, see GANDZHA.

Ganjam, dist. of India, in the N. of Madras Presidency. It has an area of 4380 sq. m. The bay of Bengal bounds the dist. on the S.E.; the low-lying plain that lies along the coast produces rice, millet, and grain. To the W. lie the E. Ghats, the jungles on the slopes of which are inhabited by very backward, indigenous tribes. Tanning and weaving are the chief industries, and Berhampur is the cap., superseding G. This old tn., once an important centre of trade, is now of little importance, having been abandoned after an epidemic in 1815. It stands near the mouth of a small riv., 90 m. S.W. of Calcutta. Pop. (dist.) 1,520,000.

Gannet, or *Sula bassana*, web-footed, aquatic bird, a species of Sulidae or Steganopodidae. It is popularly called

the Solan goose, and derives its specific name from the Bass Rock, one of its favourite haunts. It is solely an oceanic bird, with an easy and powerful flight; its entire length is about 3 ft., and the general colouring is white with a buff tinge on the head and neck; the bill is long and thick and compressed at the point. Gs. are found nesting on sev. rocky stations on the coast of the Brit. Isles, Ailsa Craig, St. Kilda, Suliskerry, and Grassholme (where it is estimated that there are over 6000 pairs belonging to the Royal Society for the Protection of Birds).



GANNETS

In late autumn they migrate to N. Africa. They feed on such fish as swim near the surface, herrings, pilchards, etc., diving swiftly, and sometimes from a considerable height, upon their prey.

Ganoidei (Gk. *gávros*, brightness), name given to one of the great orders into which fishes are divided; most of the fossil fish of palaeozoic and mesozoic ages belong to this group, whose members are generally distinguished by the skeleton being cartilaginous and the skin furnished with hard, bright scales. Fossil G. include *Holophtichius*, of the Upper Devonian, *Paleoniscus*, of the Permian, and *Cephalops*, of the Upper Silurian and Lower Old Red Sandstone strata. The living genera of G. are chiefly freshwater fishes and include *Acipenser*, the sturgeon, *Amia*, the bow-fin, *Lepidosteus*, the gar-pike, and *Polypterus*, found only in tropical Africa. It is now customary for systematists to unite the G. and Teleostei under the heading Teleostomi.

Ganshoren, tn. of Brabant, Belgium, and suburb of Brussels. Pop. 9000.

Ganymede, son of Tros, king of Dardania, was a Phrygian youth of surpassing beauty, who was borne up to heaven to serve as Zeus's cupbearer. Classical poetry is full of allusions to his fate, whilst Leochares, a fourth-century Athenian sculptor, made a fine bronze group representing the eagle with outspread wings in the act of carrying the boy to the home of the gods. Later Gk. mythology represents him as the genius of the life-

giving Nile, and anc. astronomers said he was Aquarius.

Gao, or Gogo, tn. of Fr. Sudan, Fr. W. Africa. It stands on the l. b. of the Niger, about 200 m. E. of Timbuctoo direct, and by riv. nearly twice that distance. It was once a prosperous tn., the cap. of the empire of the Songhais, and the ruins of the tomb of a Songhai leader, Mohamed Askia, are still to be seen. Of this anc. tn. nothing but ruins now remain. The Fr. estab. a military post here in 1900, and the new tn. that has since sprung up has a pop. of 9400. Mungo Park, Barth, and Ilourst visited G. in the course of their explorations.

Gao, Karveh, Persian blacksmith hero, whose sons had been slain to feed the serpents of the reigning tyrant. He raised his leathern apron on a spear as a standard of rebellion and, the revolt succeeding, the apron became the standard of the new dynasty and so remained until it was replaced by the crescent.

Gaoi, see PRISONS.

Gaoi Delivery, one of the commissions under which the judges of assize derive their authority (*see ASSIZE*). The Commission of G. D. is a patent in the nature of a letter from the king, directed to the judges of assize of each circuit (*see CIRCUIT*), king's counsel attending the circuit, clerk of assize, and associate, authorising them to 'deliver his gaol at a particular town of the prisoners in it, i.e. to try every prisoner in the gaol committed for trial on any charge whatever. As, under this commission, judges may proceed upon any indictment of felony found before other justices and not determined, their authority differs from that of justices of oyer and terminer (*q.v.*), who can only proceed w. indictments found at the same assizes. The court of king's bench (*q.v.*) on account of its status as the highest court of criminal jurisdiction, automatically determines and absorbs by its coming into any co. all former commissions of G. D. and oyer and terminer. This, however, does not apply to the Central Criminal Court. See Harris, *Principles of Criminal Law*, and Russell on *Crimes*.

Gaon (pl. *Geonim*), properly signifies pride or majesty, and the word may be a trans. of the Lat. word *clarissimus*, which was sometimes a title applied to the Rom. emperors. In the hist. of Judaism G. was a title given especially to the heads of the Jewish academies of Sura and Pumbedita in Babylon. Sura was the senior academy, and the G. of Sura was recognised by the Babylonian court as the civil head of the Jews. During the Babylonian Gaonate there were thirty-nine Geonim of Sura, beginning with Mar R. Mar in A.D. 609, and ending with R. Samuel ha-Kohen in 1034, and forty-nine Geonim of Pumbedita from Mar b. R. Hanan in 589 to R. Hail in 1038. The age of the Gaonate was marked by an excellence in literary studies and an increase of culture, especially during the rule of R. Saadia, G. of Sura in 928. Studies were not confined to the Talmud, but one of the

prin. works of the Geonim was in replying to questions of ritual, submitted to them by Jewish congregations in distant communities. A century after the death of R. Hala, the last Babylonian G., the title was assumed by the head of the Jewish academy in Palestine. This academy probably ceased to exist before the capture of Palestine by the Christians, but Mazliah retained his title of G., while at the Fostat Academy. The traditions of the Gaonate survived in Damascus, where in 1200 the teachers there were spoken of as 'the scholastic heads of Israel.'

Gap (ancet. Vapincum), cap. of the dept. of Hautes-Alpes, France. It is built on the r. b. of the Luye, 2418 ft. above the sea, and is connected by rail with Grenoble (48 m. to the S.S.E.). It possesses a fine new cathedral. Pop. 16,300.

Gap Canal, or Canal du Drac, means of communication between the Duranç and the Drac Rs., and an enormous aid to irrigation. It was dug in 1864-88, and is 455 m. long. With its arms, the Rochette and the Charance, and other subsidiary branches, it affects an area of 18,600 ac.

Garag, see GADAG.

Garamond, Claude (d. 1561), Fr. type-cutter, who designed, in collaboration with Robert Estienne, a now famous Gk. type named *Grecs du roi* (in recognition of the patronage of François I) which was first printed in an ed. of Eusebius. The modern type Garamond was designed by Jean Jannon.

Garashanin, Ilya (1812-74), Serbian statesman, b. at Garasha; son of a rich peasant. Exiled 1839 for plotting against Obrenovich dynasty; returned 1842; entered office of Ministry of Interior and helped to restore Karageorgevich family. Premier 1852-54. Dismissed, because of anti-Russian proclivities, at instance of Menshikov, but managed to keep Serbia neutral in the Crimean war. Minister of interior, 1857-58; and, at his instance, the Serbian National Assembly, after an interval of ten years, was convoked on St. Andrew's Day, 1858. It, however, restored the Obrenovich dynasty. Prince Michael, who succeeded Miloš in 1860, gave premiership to G., who obtained great concessions from the suzerain power. He began to prepare a general Balkan rising, but resigned suddenly late in 1867.

Garat, Dominique Joseph (1749-1833), Fr. publicist, b. near Bayonne. In 1790 he was a member of the Constituent Assembly whose debates he reported in the *Journal de Paris*. First won literary distinction by his *éloges* on Fontenelle and other famous Fr. writers, taking several prizes awarded by the Fr. Academy. A revolutionary at heart, he became minister of justice during the early days of the Fr. Revolution and in that capacity apprised Louis XVI. that the convention had condemned him to the guillotine, but at the same time expressed his abhorrence of the decision. Under Napoleon he was ennobled and also became a senator and president of the institute; but lost office on the restoration in 1815. See

L. Thiers, Histoire de la Révolution française, 1838 (Eng. trans. 1873).

Garat, Pierre-Jean (1764-1823), singer, secretary to comte d'Artois, Prof. in singing to the Fr. queen, he later suffered imprisonment for an original song of Royalist sympathies. The fine quality of his voice, combined with a remarkable compass, secured him an unrivalled success in the five countries of Europe which he had occasion to visit.

Garay, Janos (1812-53), a Hungarian poet, had throughout his life a struggle for a bare existence, and was obliged to eke out his livelihood with literary hack-work. Yet his numerous historical dramas, ballads, romances, and lyrics are justly treasured to-day by all his book-loving compatriots. His ambitious historical poem, *Saint Ladislaus* (1852), is his last and most celebrated work. *Arbóz* (1837) and *Bathori Erzsébet* (1840) are two of the historical plays, whilst *Balatoni Kágylok* (shells from the Balaton Lake, 1848) contains some of his finest lyrics.

Garbo, Greta (Greta Louisa Gustafsson) (b. 1905), Swedish actress, b. in Stockholm. At the age of fourteen she entered a dept. store. Took up dancing. Attended a dramatic school attached to the Royal Theatre, Stockholm. Began film career, 1922, appearing in *The Moment of Gustaf Boëting* under the direction of Mauritz Stiller and changed her name to Garbo. Then went with Stiller to Hollywood and starred in many films which brought her world-wide fame, including *Mata Hari*, *Anna Christie*, *Queen Christina*, *Anna Karenina*, and *Maria Waluska*.

Garçoã, Pedro António Corrêa (b. 1735 or 1742-72), Portuguese poet, lived a sequestered life near Lisbon till, in his thirty-sixth year, he was thrown into prison, perhaps because some of his writings had offended the autocratic gov. There he d. In most of his dramas, sonnets, odes, satires, and epistles, he was avowedly imitating classical models, and in the last two he has assuredly proved himself 'the Portuguese Horace,' a title given also to Ferreira. The purity of his taste and style undoubtedly lifted the national literature out of the mire of decadence into which it had fallen, but G. must be described as a writer of conscientious refinement rather than as a genius. See T. Braga, *Arcadia Lusitana*, 1899.

Garcia I., Sp. king, reigned over Navarre from 885 to 905. His reign was darkened by continual warfare against the Moors.

Garcia II., the Trembler ('El Tembloso'), ruled Navarre from 924 to 970. His surname was due to a physical infirmity, and in the active part he took in the struggles between Leon and Castile he proved a worthy successor to the warlike Sancho.

Garcia III., king of Navarre from 1035 to 1041. He was the eldest son of Sancho II. the Great. Defeated and killed in the battle of Atapuerca, his kingdom passing to Ferdinand's nephew, Sancho IV.

Garcia IV., ruler of Navarre from 1134 to 1150. When Alphonso the Battler, or the emperor, foolishly bequeathed Navarre to the Knights of St. John, and Aragon to the Templars, the Navarrese, refusing a foreign yoke, chose G. Ramirez, a scion of the old royal stock, to be their king.

Garcia, Manuel del Popolo Vicente (1775-1832), vocalist and composer, was famous among his contemporaries for his splendid and artistic singing, but is best remembered as the author of *The Caliph of Bagdad*, an opera performed with remarkable success at Naples in 1812. At first a chorister in the cathedral of Seville, he appeared successively in his own and other musicians' operas in Cadiz, Madrid, Paris, and London. After a profitable tour in America (1825), he was robbed of all his wealth whilst on his way to Vera Cruz. For the remainder of his life he taught his art in Paris, using the excellent system advocated in his *Método di Canto*. His son, Manuel Patricio Rodriguez G. (1805-1906), as a teacher was no less famous than his father. Prof. at Paris Conservatoire, 1842, and Royal Academy of Music, London, 1846. Inventor of the laryngoscope (1855). His daughters, Maria (1808-36) and Pauline (1821-1910), were also well-known singers. See M. Sterling Mackinlay, *Garcia the Centenarian*, 1908, and J. M. Levens, *The Garcia Family*, 1932.

Garcilaso the Inca (c. 1535-1616), as he called himself, was a Sp. historian, son of G. de la Vega and a princess of the royal line of Incas. Born at Cuzco in Peru, he early (c. 1560) migrated to Spain and passed most of his life at Cordova, where a chapel in the cathedral bears his name. Considering his intimate knowledge of his native language, his Peruvian hist., entitled *Commentarios Reales que tratan del Origen de los Incas reyes, que fueron del Peru* (1609-17), is disappointing. See study by J. Fitzmaurice Kelly, 1921.

Garcilaso de la Vega (c. 1503-36), a Sp. poet, became at the age of seventeen *continuo* or guardaman of Charles V., and displayed signal courage at the battle of Pavia (1525), fought in 1529 against the Turks, who were trying to reach Vienna, was present at Bologna in 1530 at the magnificent coronation of the emperor, and in 1532-34 served Don Pedro de Toledo, the viceroy of Naples. Wounded during the Tunis expedition of 1535, he met his death the following year whilst storming a small fort in Italy during the retreat from Marseilles. He is the finest pastoral poet of Spain, and with Boscan, his friend, shares the honour of having popularised the It. hendecasyllable verse. His finest poem is the first of his three eclogues, penned in Naples under the inspiration of Virgil's tomb. Only a few odes and sonnets are included in his scanty remains, but they are fine enough to enrol him among the classics, and, as Ticknor says, 'Garcilaso de la Vega has come down to us enjoying a general national admiration such as is given to hardly any other Spanish poet, and to none before his time.' He was the author

of that great sonnet which begins 'O dulces prendas por mi mal halladas.' See study by H. Keniston, 1922.

Gard, S. dept. of France, corresponding to the old prov. of Languedoc, and confined on the N. by Lozere and Ardèche, on the E. by the Rhone (its chief riv.), on the S. by the Mediterranean, on the S.W. by Hérault, and on the W. by Aveyron. The Céze, the Ardèche, and the Gard are all affluents of the Rhone. Ridges of the Cévennes, which in l'Aigoual attain an altitude of 5120 ft., cover the N.W. portion, whilst at the S. low marshy plains, which yield quantities of salt, stretch away to the sea. The Garrigues comprise the rest of the dept., being a hilly, dry limestone dist., tormented with the biting N.W. wind known as the *mistral*. G. yields splendid crops of wheat, oats, and rye, abounds in mulberries, olives, and vines, is known for the excellence of its cattle, and has a plentiful store of mineral wealth, including coal, iron, lignite, copper, zinc, and lead. Alais, the centre of the silk industry, Besseges, Nîmes, the cap., and La Grand' Combe are important tns. in the mining dist., other cities of note being Alèques-Mortes, Uzès, Beaucaire, Saint-Gilles, and Le Vigan. There are three arsons., Nîmes, Alais, and Le Vigan. The total area is 2270 sq. m. Pop. 393,200.

Garda, Lake of (ancet. *Lacus Benacus*), largest of the Lombard lakes, lies partly in the prov. of Verona and partly in that of Brescia, in Italy; except Riva, the most important city on the lake shores, which lies at the N. head, and is in Tyrol. At this extremity the Sarca feeds the lake from the glaciers of the Adamello, whilst the Mincio flows out at the S. end to join the Po. Here too the beautiful and luxuriant promontory of Sermione, the 'Sirmio' of Catullus, juts outward into the lake, separating the tns. of Peschiera and Degenzano, which lie 31 m. apart. On its E. fringe G. is overlooked by the precipitous grey cliffs of Monte Baldo, but opposite, on the W. shore, between Gargnano and Salò, stretches a fertile region, where olives, lemons, and mulberries abound. G. lies 213 ft. above sea level, has an area of 142 sq. m., a length of 33 m., and a breadth varying from 2 to 10 m.

Garde Nationale, of France. A body of armed citizens, organised in Paris in 1789 for civic defence. In 1795 they helped to put down the Parsonian mob and, in the revolutions of 1830 and 1848, supported the revolutionaries. In 1871 they were dissolved by Parliament.

Garden Art. The first gardens were made when the early nomadic tribes settled down on an approved spot, surrounded themselves and their herds with a hedge as a protection against wild beasts, and within their enclosure planted vegetables and fruit trees for their sustenance. Little art was used in their formation, but planting in regular rows was recognised as a useful measure in order that the plants should receive the attention they required. Ant. tablets from Egypt show orderly rows of syca-

more, fig-trees, and date-palms under cultivation for their enjoyable shade, profitable fruits and wood. That flowers were grown for pleasure is indicated by a representation in a Theban tomb of early date of beds of cornflowers, poppies, and papyrus growing by the side of a canal. Parks of trees with cared-for paths and bushy undergrowth were instituted by the Babylonians, who also invented about the ninth century the 'hanging gardens of Semiramis'—one of the wonders of the world—a series of terraced gardens supported by strong arches. The acclimatisation of foreign trees in his own land began with Tiglath-Pileser I, c. 1100 B.C. The early gardens of Greece were strictly utilitarian, consisting of vegetable beds, and our modern pot-gardening began when the votaries of Adonis sowed in earthen pots fennel, lettuce, wheat, and barley—plants which sprang up soon and as quickly withered, thus symbolising the early violent death of the beautiful youth. The gymnasiums of early times were finely ornamented with park grounds, and were later constructed with the addition of baths. Both in Greece and in Italy fountains, water-works, and statuary have always played a leading part in the formation of a garden; and in Spain and France these are important. The wonderful water devices in the ruined garden of the Villa d'Este at Tivoli still reflect in some measure the marvels of the Renaissance. In England during the early part of the Christian era useful plants constituted the gardens, while the rose and lily were regarded as being health-enriching plants; later they became the symbol of Mary and the reward of martyrdom. During the Middle Ages ladies of the household used to attend to the gardens, having learned from the monks the art of growing healing herbs among their vegetables (an early garden was called *Ortus sanitatis*, the place of health); flowers were planted in the grass, clipped trees, arbours of roses and honeysuckle, turf seats, and outdoor baths added to the later pleasures of gardens, and meals in the open air became popular.

Among great garden artists or architects were Rainaldi, Le Blond (who worked for Peter the Great), Boceau (Fr. Renaissance garden artist and architect of the Versailles garden), Andre Le Nôtre (seventeenth-century Fr. garden artist, who worked at Versailles and Vaux-le-Vicomte), Léon Battista Alberti (It. Renaissance), Bramante (It. Renaissance), Lancelot Brown (Eng. landscape garden artist), Sir Joseph Paxton (who laid out the Chatsworth gardens), and Winckelmann. England has learned much from other countries in the making of gardens—as the Dutch sunken gardens show, or the oriental influence at work in the pagoda at Kew—but in naturalness she is supreme; the unrivalled lawns with herbaceous borders, or rock borders planted with alpine flowers, are part of her glory. Hampton Court, Kew Gardens, Hyde Park, and Regent's Park all supply beauty and inspiration to dwellers in London; and among exquisite private

gardens are those at Sandringham in Norfolk, Chatsworth in Derbyshire, Aldenham House in Hertfordshire, The Pleasaunce in Overstrand, Norfolk, and Wisley Gardens in Surrey. America has vast national parks and also charming domestic gardens; they are usually enclosed by hedges, vines on lattice screens, or masses of informal plantings; climbing vines on porches and walls are popular; clipped trees and shrubs and statuary are very little used. See also GARDENING, LANDSCAPE GARDENING. For a full, illustrated, scholarly work consult *A History of Garden Art* by M. L. Gothein, trans. by L. Archer-Hind, and ed. by Walter P. Wright, 1928; G. Gromort, *L'Art des jardins*, 1931; and H. F. Clark, *The English Landscape Garden*, 1948.

Garden Cities are indigenous to England; the only two examples are Letchworth Garden City (1903) and Welwyn Garden City (1920), both in Hertfordshire. They owe their origin to the enthusiasm of Sir Ebenezer Howard (q.v.) and his book *To-morrow: a Peaceful Path to Real Reform* (1898), subsequently issued as *Garden Cities of To-morrow* (1902). There were, prior to these G. Cs., 'industrial villages,' built by manufacturers near industrial centres, of which the most famous are Bournville and Port Sunlight. The three-fold character of the garden city—industrial, agric., and residential—differentiates it from the 'industrial' or 'garden' suburb, like Hampstead, on the other, with which latter indeed it is often confused. Neither is the garden city mere tn. planning, although it provides for tn. planning. It is essentially a self-contained unit launched *de novo*, and not a mere scheme of land development. Sir Ebenezer Howard's idea was to check the migration of pop. from the country dists. to the overcrowded tns. by establishing new industrial areas in rural dists. His proposal was to build these new tns. on land held in trust for the community, so that the increment in the land values should be secured for the benefit of the people who created it. The tns. were to be limited in extent and were to be surrounded by an agric. belt.

Letchworth was estab. in 1903 by a joint stock company (First Garden City Ltd.), with a nominal share capital of £300,000, entitled to a cumulative dividend limited to a maximum of 5 per cent. The property purchased consisted of 3322 ac. at a cost of £160,378. Subsequent purchases have increased this area to 4398 ac. On this area a tn. of 30,000 inhab. was planned; the company undertook the construction of roads, drainage, water, gas, and electricity supplies. The complete tn. was planned in outline before building started, and provision was made for residential, commercial, and industrial areas and for an agric. belt surrounding the tn. To facilitate control land was let on lease, the freehold control being retained by the company. Building started in 1904, and at the present date (1949) there is a pop. of 21,500, with many industries employing a large proportion of the inhab. The indus-

tries include heavy and light engineering, printing, bookbinding, furniture, corsets, parachutes, embroidery, tabulating machinery, baby carriages, refuse-collection vehicles, scientific instruments, and many smaller industries. In Jan. 1948 the urb. dist. council passed a resolution requesting the minister of tn. and country planning to set up a development corporation for

company has issued debentures and has received loans from the Public Works Loan Board under the Housing Act of 1921. The tn. was planned for a pop. of 50,000. At the present date (1949) the pop. is 18,000. A large proportion of the inhab. travel to London daily, but a number of important industries has been estab., including breakfast foods, chemicals, en-



LETCHWORTH GARDEN CITY

Letchworth Garden City Ltd

Letchworth under the New Towns Act, 1946, but the minister declined, indicating that he considered the company was a suitable instrument to complete the development of the tn. By the nationalisation of its electricity and gas undertakings the company was faced with a considerable loss of revenue, but from the proceeds was enabled to discharge nearly all its loan capital.

Welwyn Garden City was estab. by a joint stock company in 1920 with the nominal share capital of £250,000, entitled to a cumulative dividend of 7 per cent. The property purchased consisted of 2378 ac. at a cost of £105,804. The

engineering, wireless apparatus, and films. A notable feature of Welwyn Garden City is that no shop sites were disposed of by the company in the early stages, the shopping facilities being provided by a subsidiary company. Another subsidiary company was formed by licensed premises. Particular attention has been paid at Welwyn Garden City to the architecture of the tn., and speculative building in the ordinary sense has not been done on any large scale, most of the buildings having been erected as part of definite architectural schemes. There is an agric. belt, but its area is small. On May 20, 1948, an order was made by the minister of tn. and

country planning setting up two development corporations for Welwyn Garden City and Hatfield New Tn. Thus the future development of the tn. was taken out of the hands of the Garden City Company. Welwyn Garden City is more under the influence of London than Letchworth, as it is much nearer.

The lessons that the two G. C. teach are that development of new residential and industrial units is practicable and that they offer an alternative to the ordinary sporadic development in the neighbourhood of tns., and that the preservation of rural England need not entail any arrest of human activities or enterprise even in their most modern form.

Satellite Towns and Trading Estates.—The term satellite town arose somewhat later than that of garden city, and indicates a development on garden city lines, but in the neighbourhood of, and to some extent dependent on, an existing large tn. G. C. and satellite tns. were the subject of investigation by a departmental committee (chairman Lord Marley), which reported in 1935. As this committee pointed out, there has been a tendency since 1920 to confuse the two terms, and they thought it 'questionable whether at this date there ... any value in the maintenance of the expressions in any definitive sense.' The committee advocated the fullest adoption of the type of development usually associated with the idea of a garden city, while making other and more general recommendations as to better planning. They also recommended the estab. of a planning board under whose aegis should be brought land development and redevelopment throughout the country, but no action was taken to set up the proposed board. As in the case of G. C., so in that of satellite tns., there are two outstanding examples: Wythenshawe and Speke, developed respectively by the corporations of Manchester and Liverpool. They owe their origin to local authorities, and are framed, primarily at any rate, to meet rehousing requirements in connection with large and crowded municipalities; they are in fact housing developments carried out largely on garden city lines, including provision for industry. What are known as trading estates also fall into two categories: (a) Estates such as Trafford Park and Slough, financed by private enterprise on a profit-making basis; and (b) estates such as Team Valley near Gateshead, Treforest near Cardiff, and Hillington near Glasgow, started with a view to grappling with the severe unemployment problem in those areas. Those latter estates owe their origin to the commissioners for the special areas in England and Scotland. They are undertakings not carried on for gain, and are financed by loans from the special areas fund. The companies responsible for the estates are not expected to pay interest on the loans during the early period of development, usually anticipated to be about five years, but thereafter it is assumed that interest at the rate of 4 per cent will be payable.

It is important to bear in mind the different aims and circumstances attending these various communities. G. C. and satellite tns. are attempts to provide both sites for industry and homes for the workers employed, together with centres for community life: Wythenshawe and Speke were undertaken in the first instance by the local authority as housing schemes, but they also set out to provide accommodation for industries within the community and to stimulate the community idea. Trading estates set out to offer facilities and attractions to industries seeking location, but provision is not made by the estate companies, except to a small extent, for housing the workers employed by tenants on the estate. But in relation to the problem of the distribution of the industrial pop. all these various communities have features in common: all have been founded in more or less definite relation to, but at varying distances from, large urb. units; all are intended to give to industry or an industrial pop., or both, opportunities that are not usually available in the big urb. centres. These opportunities, so far as an industrial pop. is catered for, take the form of improved facilities for housing accommodation, for open spaces, and for recreation; and, in the case of industry, for better planned and generally cheaper factory accommodation. All represent, in greater or less measure, and in various stages of development, experiments in decentralisation of industry or of industrial pop., or of both.

Barlow Commission and Scott Committee Reports on Garden Cities, Satellite Towns, etc., in Relation to Decentralisation of Industry.—According to the Report of the Royal Commission on the Distribution of the Industrial Population (commonly known as the Barlow Report -Cmnd. 6153, 1940) G. C. and satellite tns., seek to embody a system of social life in connection with, but distinguishable from, factory activity, and some liberal-minded and far-sighted employers have also made interesting experiments on somewhat similar lines (see above as to Bournville and Port Sunlight). It is doubtful, in the opinion of the Barlow commission, whether in the future 'there will be so much necessity for such experiments, owing to the enlarged powers and duties imposed on local authorities by the Housing Act.' The commission considered to what extent and under what conditions resort might in the future be had to the expedient of establishing G. C. and trading estates as a contribution towards the problem of decentralisation in the case of overgrown and congested urb. areas, and whether in fact they were capable of further extensive development. The commission came to an affirmative conclusion, provided the development were well considered, but that the development of G. C. was not likely to proceed successfully if left entirely to private enterprise, on account of the magnitude of the financial commitments involved. Success was, in their view, much more likely to be obtained if the development

were undertaken by municipal authorities, especially in cases where they were faced with the necessity of decentralisation with a view to meeting their responsibilities in relation to housing needs.

According to the *Report of the Committee on Land Utilisation in Rural Areas* (known as the Scott Report—Cmnd. 6378, 1943) there was, during the Second World War, 'a widespread movement among town planners that new construction after the war should take the form of well-designed towns with a spacious lay-out, where the areas devoted to housing should be carefully sited in relation to the industrial sections and the shopping and community centres, where the houses should be designed as integral units in well-conceived street lay-out, and have abundant garden space, and where indeed there were all the facilities for a complete and satisfying life both for the individual and the community as a whole.' These are the ideals which the founders of the garden city movement had in mind and which the G. C., despite the erroneous views frequently held about them, have endeavoured to achieve. The Scott Report goes on to suggest that it may be that satellite tns. to be built beyond the green belts of existing tns. would be of this type, and that as their demand for rural land would be considerable, any proposed sites should be examined with the utmost care from both national and local standpoints. The amount of good farmland in England and Wales being very strictly limited, the Scott committee states that unless there are strong reasons to the contrary, new tns. should not be sited on good agric. land. The report states: 'We have examined carefully the view that the gardens, being intensively cultivated, of a garden suburb, provide more produce than if the whole area were farmed, but we are unable to accept this view. The comparison in the case of good land should be between the proportion of the gardens which is used in the growing of fruit and vegetables, and the whole area if it were under intensive market gardening. Reliable figures of the proportion, after due allowance has been made for roads, footpaths, actual house area, garden paths, lawns, flower-beds, etc., of the total area used productively are not available, but in cases examined it is not above 25 per cent, and we take the view that once good agricultural land is taken for housing it is of necessity lost to agriculture for ever, no matter how desperately it may be needed in the future for food production. We accordingly recommend (i) that new satellite towns, housing estates, garden cities, and suburbs be sited wherever practicable away from the better farm land; (ii) that in their siting due attention be paid to agricultural considerations; (iii) that as in the case of the planning of existing towns the Ministry of Agriculture be consulted from the inception of the planning schemes.' The New Town Act of 1946 provided the necessary machinery for the development of new tns. on the principles advocated by Sir Ebenezer

Howard: in 1947 work was begun on the first of these at Stevenage, 5 m. from Letchworth.

Although the term garden cities is sometimes said to have originated in America the Amer. conception of them was not that of Sir Ebenezer Howard, and there has never been in the U.S.A. any development of these cities in the Eng. sense. Garden vils. or suburbs in the U.S.A., frequently called G. C., have been the creation of great industrial companies, which have estab. new plants in growing tns. and housed their employees in homes situated near the factories. There are also so-called G. C. which are high-class residential estates. See reports mentioned above and C. B. Purdom, *The Building of Satellite Towns*, 1925, 1949.

Gardenia, genus of greenhouse and stovehouse plants, belonging to the order *Rubiaceæ*. There are a good many species, but few are grown except in botanical gardens. Much the most popular is Florida as represented by its double white variety, which is a favourite button-hole flower with those who appreciate its powerful and penetrating fragrance as well as its symmetry and purity. The scent is, however, too strong for some people at close quarters. The plant thrives in a warm greenhouse if the air is kept moist, but it dislikes aridity. Fibrous loam should be the prin. component of the compost, lightened with leaf-mould, decayed manure, and sand. Propagation is by cuttings in bottom heat in spring.

Gardening. Development of G. in Britain and America since the latter part of the nineteenth century has been rapid and almost continuous. It was not checked either by the world war of 1914-18 or by that of 1939-45, as were many other branches of art and industry. Both wars did, however, change its direction. Wartime demands for economy and home-raised food led, in each case, to increased efforts to grow vegetables and fruits in home gardens and on allotments. Increasing taxation and labour stringencies were reflected in a reduction of large private estates and their amenities. In the Second World War gov. direction of horticultural cropping and their sponsored 'Dig For Victory' campaigns led to a great decline in flower cultivation and ornamental gardening, but a vast increase in the ranks of gardeners. Lingering food difficulties and slow recovery of nursery stocks have served to delay advances in floral G. The human need for beauty, however, is irpressible, and the indications are that ornamental G. on more labour-saving and less spacious lines than in the past will find new and greater expression in the coming years. The ever-growing awareness of the need for open spaces, municipal parks, gardens, and playing-fields only serves to emphasise the increasing and valuable part that G. now plays in national life.

History.—Limits of space preclude a lengthy disquisition on this subject, nor is it necessary, in view of the fact that ample information is readily accessible in such

complete and richly illustrated works as Goethe's *A History of Garden Art*. It is there shown that G. has been pursued from the earliest ages of which records exist. Nor should it be assumed that the art of the pre-Christian era was mean and crude. Egyptian, Assyrian, Babylonian, and Persian monarchs had skilled gardeners in their service long before the days of Virgil. Antc. Egypt, antc. Greece, antc. Rome, all had beautiful gardens. Persepolis and Palmyra, Babylon and Nineveh, Thebes and Memphis, Bagdad, to name but a few great tns. of the past, were famous for their parks and gardens. It is probable that Gk. and Rom. G., which in due course spread its influence and gave its lessons to W. Europe, derived in the main from the Near and Middle E., but the Far E. must not be overlooked, because gardens were also cultivated in India and China from very early times. The Rom. were the chief agents concerned in introducing G. into England, and they instructed the early Britons in the growth and use of many vegetables and fruits hitherto unknown to them. When the Romans were compelled to leave Britain G. languished, but it revived under the influence of the monks after Christianity had been introduced, and a considerable variety of vegetables and medicinal herbs, together with many fruits, were grown. Flower cultivation was little practised at first, but in the three centuries which followed the Norman Conquest there were developments in ornamental culture, and in the Middle Ages gardens gradually increased around the palaces, castles, and granges; walks, terraces, steps, balustrades, summer-houses, statues, lakes, and fountains, etc., being formed. Labyrinth became popular.

The Renaissance brought a remarkable development in ornamental G., both in France and Italy, and its influences spread to Britain; they were, however, formal. Topiary work, i.e. clipping yews, etc., into fantastic shapes, came into fashion. Even in the eighteenth century formalism reigned, and it was left for Addison (essay in the *Spectator*, 1712), Pope (essay in the *Guardian*, 1713, and *Epistle on Taste*, 1731), Whately (*Observations on Modern Gardening*, 1770), and Horace Walpole (*Essay on Modern Gardening*, 1785) to condemn the monotonous repetitions of the formal school. Pope, aided by the famous gardener Kent, carried his principles into practice. The latter, with Bridgeman and 'Capability' Brown, estab. the Eng. or natural system. Briefly this is an imitation of nature; the most beautiful trees, shrubs, and flowers for the space required being arranged in as natural and happy a combination as possible. Later, Chambers, Knight, Loudon, and others did good service, while in quite modern times Robinson, Veitch, Wilson, Farrer, Kingdon Ward, Forrest, and others exercised great influence as gardeners, writers, or introducers of new plants. (See also GARDEN ART.)

Layout.—Coming to practical matters, it will be obvious that great detail is impossible within the limits of this article,

but a few hints may be given. While some operations can be carried out in large gardens which are impossible in small ones, it may be assumed that most gardens have sufficient space for a flower garden, a kitchen garden, and a lawn of greater or less size. Except in very small gardens ornamental trees and shrubs should be used as freely as possible. Roses should be planted in beds and on walls, arbours, and fences. A rockery, large or small according to space and means, is an attractive feature, and a pool for water-plants can often be associated with it to advantage. Shrub borders are valuable for their permanence and labour-saving. Herbaceous borders are still popular, though the tendency is to introduce flowery shrubs and Polyantha roses to save labour. In small gardens annuals and biennials, raised from seed, are excellent, while bulbs for autumn and spring planting provide beautiful flowers with little trouble.

Shelter.—Most gardens are more or less enclosed. If hedges form boundaries, they are ornamental in themselves when kept trimmed. Yew, holly, beech, hornbeam, hawthorn, privet, box, Lawson's cypress, thuja, and *Lonicera pumilansis* are good subjects for boundary hedges. Laurels and privet are too troublesome, except for larger gardens. For internal hedges, barberries, escallonia, lavender, *Lonicera nitida*, rosemary, sweet briar, and veronica are suitable. Walls should be decorated with some ornamental plant or trained fruit tree. Actinidia, roses, clematis, honeysuckle, and wistaria are ready choices, but even a N. wall will favour winter jasmine, Virginian creepers, kerria, or ivy. Fences may similarly be made ornamental.

Paths.—For hard wear in all weathers paths may be of stone, bricks, concrete, macadam, or gravel, but occasional paths within the garden may be of grass. All hard paths should be made on foundations of 4-8 in. broken brick or stone, with 2 in. of ash or sand, on which to lay the final surface, finished with a slight crown or slope to one side ($\frac{1}{4}$ in. per foot width) for drainage. The surface of gravel paths may be fixed with a cold bitumen product. An ann. dressing of weed-killer keeps paths free from greenness. Edgings of metal, stone, or bricks are best to keep a walk in place. Plant edgings are only good for occasional paths, and here dwarf box is right.

Lawns.—As the base ground or carpet against which flowers and ornamental plants are seen at their best, well-kept turf is an essential feature of most gardens. A lawn may be made from turf or seed. In either case the soil should be adequately prepared, drained, levelled, cultivated, and fertilised beforehand. A lawn from turf is best laid between Sept. and Feb., (good sods are cut 12 in. wide, 1 in. thick, and 1 to 3 ft. long, from heath, moorland, parkland, or sea-washed marsh turf). Laying is done in a forward direction, with a board on the now-laid sods, which are alternated to overlap at the joints. Lawns from seed are best made in early Sept., or April for second choice.

The finest lawns are made with such grasses as Chewing's Fescue and New Zealand Brown-top or Bent, but the seed mixture should be made up to suit (1) the soil, (2) the situation, and (3) the purpose of the lawn. To sow evenly at 1-2 oz. per sq. yd. divide seed into two lots, mix with an equal bulk of dry sand, and sow a square yard at a time, sowing one way with one lot of seed, and crosswise with the other. Protect from birds by a network of black cotton thread on sticks. A light rolling when the grass is 2 in. high, followed by a high cut, removing no more than 1 in. of grass blades, and a sifting of rotted organic matter as a top-dressing, will give the sown lawn a good start. The management of existing turf may be based as follows: Autumn—top-dress with sharp sand and finely broken charcoal. Winter—acerate thoroughly by spiking or piercing turf mat with spiking tool or fork. In Feb., top-dress with soil compost (2-3 parts, by bulk, good loam, 1 part rotted organic matter, 1 part sand) at 1-2 lb. per sq. yd. Spring—apply complete lawn fertiliser in March. Use weed-killers from April to June. Selective hormone herbicides (MCPA or Methoxone, DCPA or 2 : 4-D) destroy plantain, starweed, self-heal, cat's-ear, dandelion, and many common weeds. Lawn sand is best for daisy and clover. Summer—mowing frequently, and with not too close a cut, strengthens grass growth and inhibits weeds best. Moss implies diminishing soil fertility, poor drainage, or matted turf. Spraying with a 10 per cent solution of tar-oil wash kills moss in winter, but basic causes must be removed for permanent improvement.

Trees and Shrubs.—Forest trees belong to the estate or park, and such species as sycamore, chestnut, alder, beech, sweet chestnut, ash, walnut, tulip-tree, plane, poplar, oak, lime, and elm are best excluded from the small garden. Here, a choice should be made from birch, thorn, laburnum, magnolia, prunus, cherries, almond, peach, crab-apple, rowan and service trees, dogwood, and willows, which have foliage, floral, bark, or berrying colour to offer. Evergreens such as holly, strawberry-tree, *Azara microphylla*, and laurels are useful for screening. Conifers need to be planted judiciously in a country where so many of them are foreign. The native yew and juniper seldom come amiss. It is among the cypresses, cedars, retinosporas, and thuias that pleasing conifers of suitable stature and shades of green are to be found, while pines and spruces supply miniatures for the rock garden. Shrubs combine permanence with floral and colourful grace, and are increasingly planted for their labour-saving virtues. They may be planted singly, in groups, in borders, or in combination with herbaceous flowers. A list of the popular species according to their flowering season would include: Winter—*Elaeagnus* sp., *Jasminum nudiflorum*, *Eurya darleyensis*, *E. carnea* and vars., *Viburnum fragrans*, *Chimonanthus fragrans*, *Hamelia mollis*, *Lonicera Slandishii*, *L. fragrantissima*, *Prunus davidiana*, *P. kansuensis*, *Vibur-*

num Tinus, *Camellia Sasangua*, *Clematis calycina*, *Azara microphylla*, *Cornus mas*, *Daphne Mezereum*, *Garrya elliptica*, *Corylus* sp. Spring—*Magnolia stellata*, *M. conspicua*, *Forsythia* sp., *Prunus cerasifera*, *Erica mediterranea*, *E. Veitchii*, *Rubus* sp., *Corylopsis* sp., *Daphne blagayana*, *Stachyurus* sp., *Rhododendron* sp., *Prunus persica* and vars., *Berberis* sp., *Prunus lanigiana* and vars., *P. serrulata*, *P. avium*, *Pieris* sp., *Viburnum Carlesii*, *Osmanthus Delavayi*, *Azaleas*, *Malus* sp., *Cytisus* sp., *Syringa* sp., *Ceanothus* sp., *Laburnum* sp., *Cistus* sp., *Helianthemum* sp., *Spiraea* sp., *Philadelphus* sp., *Gentia* sp., *Deutzia* sp., *Lonicera* sp., Summer—*Kalmia latifolia*, *Zenobia pulverulenta*, *Buddleia* sp., *Styrax japonica*, *Viburnum tonnetosum* and vars., *Fabiana imbricata*, *Escallonia* sp., *Daboecia polifolia*, *Erica cinerea* and vars., *E. tetralix*, *E. Mackayi*, *E. ciliaris*, *Spartium junceum*, *Genista setensis*, late *Ceanothus* sp., *Larendula* sp., *Veronica* sp., *Olearia Haastii*, *Clethra* sp., *Eucryphia glutinosa*, *Ihydrangea* sp., *Erica rufa*, *Yucca* sp., *Clematis Jackmani*. Autumn—*Hibiscus* sp., *Clerodendron Fargesii*, *Perovskia atriplicifolia*, *Caryopteris* sp., *Romneya* sp., *Collecta armata*, *Fuchsia* sp., *Abelia* sp., *Hohoria populnea*, *Falsia japonica*, *Salis Rockii*; and for their berries—*Cotoneaster* sp., *Malus* sp., *Pyracantha* sp., *Pernettya* sp., *Skimmia* sp., *Berberis* sp., *Rosa* sp., *Stranvaesia* sp., *Aucuba* sp., *Sambucus* sp., *Rhus* sp.

Herbaceous Borders.—There is nothing better suited to skirt a lawn than a border of hardy herbaceous perennials. No matter how small the garden it can be provided, the point being to adapt the selection of plants to the area available. Herbaceous (i.e. non-shrubby) plants vary greatly in height and spread; some require only a square foot of space each, others a yard or more. While large plants should not be put into small borders, small plants may be used for the front areas of large borders, as in many cases they are very beautiful and also easily grown. The following selection of plants will be useful in either case, because the plants marked 'middle' and 'back' are suitable for such positions in large borders, whilst those marked 'front' will come in handy for the front areas of large borders and the main areas of small ones.

Achillea ptarmica. The Pearl (front).
Aconitum (monkshood) (front). Root poisonous.
Astroemeria (front). Very graceful.
Ancus (front).
Anemone, poppy and Jap., the latter the taller, but both front.
Anthemis (front).
Inthericum (front), very graceful.
Agave (columbine) (front).
Armeria (middle).
Artemisia (middle).
Asters (Michaelmas daisies), *alpinus* and *ericoides* (front, most middle and back).
Astilbe (back).
Baccharis cordata (back).
Heliotrope (back).
Campanula (most front).

Calananche (front).
Celsia (front).
Centaurea (back).
Chrysanthemum, koreanum, maximum, and leucanthemum (middle or back).
Cinicifuga (back).
Coreopsis lanceolata and grandiflora (front).
Delphinium nudicaule, cardinalis, and Blue Butterfly (front, most back).
Dicentra (front).
Doronicum (front). Early bloomers.
Echinops (middle).
Eremurus (back).
Eryngium (front).
Eryngium (sea holly) (middle and back).
Funkia (front).
Gaillardia (front).
Galipa (back).
Geranium sanguineum and pratense (front).
Geum (front).
Gypsophila paniculata (gauze flower) (middle and back).
Helenium (front).
Helianthus (sunflower-s) (most back).
Heliopsis (back).
Helleborus (Christmas and Lenten rose) (front).
Hemerocallis (day lilies) (front).
Huernia sanguinea (front).
Holly hocks (back).
Hynechites (front).
Indigo glauca (front).
Irises (front).
Kniphofia or *Tritoma* (red-hot poker) (middle).
Linaria (front).
Lobelia cardinalis and fulgens (front or middle).
Lupinus polyphyllus, hybrids and varieties, splendid (middle).
Lychis chateaudouini, L. *Fiscaria splendens plena*, etc. (front).
Lythrum (middle).
Mesembryanthemum *Waltschii, nepalensis, and Baileyi*, beautiful poppies (front or middle).
Mimulus (front).
Monarda (bergamot) (front).
Narcissus (front).
Oenothera (evening primrose) (front).
Paeonia, magnificient (front).
Papaver, perennial poppies (middle or even front), also *nudicaule* (front).
Pentstemon (front).
Phlomis (middle).
Phlox, one or two dwarf varieties, such as Mont Blanc, front, most middle. Invaluable plants.
Physalis Franchetii (winter cherry) (front).
Platycodon (middle).
Polygonatum (front).
Potentilla (front).
Primula sp. (front).
Pulmonaria (front).
Pyrethrum (front). Brilliant colours, early bloomers.
Rodgersia (back).
Romneya (back).
Hedbeckia (front or middle, in rich soil).
Salvia (middle).
Scabious, including *caucasica* (front).
Scutellaria (front).
Sedum spectabile (front).
Senecio (middle to back).
Sidalcea (back).

Solidago (golden rod) (back).
Spiraea Aruncus, filipendula, and Ulnaria (back); *palmaria* and *astilboides*, with their varieties (front).
Stachys (front).
Statice latifolia (front).
Thalictrum minus (Maidenhair-like) (front).
Tiarella cordifolia (front).
Trollius (front).
Urticaria (front).
Valeriana (middle).
Viburnum (middle to back).
Veronica, sev. species (front).
Viola (front).

For full descriptions see *The Wright Encyclopedia of Gardening*.

Clearly, there is no lack of hardy herbaceous plants suitable for small borders. Empty spaces can be filled with annuals and biennials. Squat plants like double daisies, pansies, polyanthi, primroses, and bulbs such as snowdrops, narcissi, scilla, and tulips, and corms such as crocuses and gladioli may be used to lend added colour. Most soils can be made suitable for herbaceous plants. Light soils need rotted organic matter (dung, compost, leafmould, peat, shoddy, etc.). Heavy soils are improved by draining, liming, and incorporating dryish organic litter (peat, compost, hop manure, etc.). An annual dressing of organic manure should be given in autumn or early winter. If herbaceous plants are to prosper they must be lifted and divided every two to three years, usually in autumn, or spring. The centre and older part of the lifted plant is discarded, the younger, more vigorous outer parts being retained for replanting and propagation.

Rock Gardens.—Although there is much potential interest and charm in a rock garden, its construction requires skill, its planting care, and its maintenance regular attention. The ideal site is sunny, yet with partial shade during the day. It is easier to build on a natural slope than on the flat, which presents difficulties in blending a raised rock garden with the garden as a whole. Good drainage is essential for alpine plants, and on heavy soils a good bed of rubble or hard core should underlie the construction. A rock garden should represent a natural stone outcrop in miniature. It may incorporate a ravine, stream, or scree. The stone used should be chosen from sedimentary rocks - Westmorland, Cumberland, or Cheddar limestone, or a good sandstone; not igneous granite, gabbro, or basalt. Two principles should guide the placing of rocks: the strata of the rocks must run in the same plane with the graining parallel, and joints between stones should be at right angles; the exposed rock should be sunk well into the soil, to suggest a preponderant mass of stone underneath. The soil should be reasonably, but not too fertile, and well rammed about the stones. Planting pockets and crevices are best filled with soil compost to suit the chosen plants. A good basic mixture is one part by bulk loam, two parts each sand and leaf-mould, plus two handfuls of bone-meal per barrowful. For lime-loving plants

add a handful of crushed chalk or limestone dust. Calcifuge plants may need extra leafmould or peat. Alpine plants dislike wet around their necks, and a collar of limestone chippings is often helpful to drainage. Others, chiefly those with downy leaves, should be given the protection of small glass covers in winter. Alpine plants are now generally sold *ex* pots, and so planting can proceed at almost any time of the year, weather permitting. Many alpines can also be raised from seed without much trouble. The following list includes selected species of good character. Fuller descriptions and information on culture will be found in *The Wright Encyclopædia of Gardening*.

- Acaena microphylla*, etc.
- Achillea Clavennae, leviss., tomentosa*.
- Aethionema* × Warley rose.
- Alyssum sarmentosum, serpyllifolium*.
- Andromeda polifolia compacta*.
- Androsace carnea*, etc.
- Anemone apennina, blanda*.
- Anthyllis montana*.
- Antirrhinum asarina, sempervirens*.
- Aquilegia akensis, glandulosa*, etc.
- Arabis* sp.
- Armeria cespitosa*.
- Asperula suberosa*.
- Aster dumosus* × Nori-Belgii.
- Aubrieta deltoidea* vars.
- Culcularia tenella*.
- Campanula* sp.
- Cassiope lycopodioides*.
- Ceratostigma Griffithii*.
- Corydalis lutea, nobilis*.
- Crocus* sp.
- Cyclamen coum, hiemale, europaeum*, etc.
- Dianthus* sp.
- Eranthis hyemalis*.
- Erica carnea, cinerea, tetralix, vagans*.
- Erinus alpinus*.
- Frankenia thymifolia*.
- Galanthus* sp.
- Gentiana* sp.
- Geranium argenteum, farreri*, etc.
- Helianthemum alpestre, vulgare*, etc.
- Iberis* sp.
- Incarvillea grandiflora*.
- Iris* sp. (dwarf bulbous types).
- Leontopodium alpinum* (edelweiss).
- Linaria* sp.
- Linum alpinum*, etc.
- Lithospermum diffusum*.
- Muscaris* sp.
- Myosotis rupicola*.
- Narcissus* sp. (miniatures).
- Omphalodes cupradocica*.
- Onosma albo-rostrum, echiodies*.
- Papaver alpinum*.
- Pensilemon* sp.
- Phlox* sp. alpine.
- Polemonium caeruleum*.
- Polygala Chamaebuxus*.
- Potentilla nitida*.
- Pratia angulata*.
- Primula farinosa*.
- Primula* × *Garryarde* vars.
- Primula* × *Juliana* vars.
- Ramondia Myconii*, etc.
- Ranunculus* sp.
- Saponaria ocymoides*.
- Saxifraga* sp.

- Sedum* sp.
- Sempervivum* sp.
- Silene acaulis*.
- Solanella alpina, pusilla*, etc.
- Stokesia cyanea* and vars.
- Thlaspi rotundifolium*.
- Thymus* sp.
- Tulipa kaufmanniana*, etc.
- Veronica* sp.
- Viola cornuta, gracilis*, etc.
- Wahlenbergia* sp.

Annual Flowering Plants.—In common with other classes of flowers, annuals, hardy and tender alike, have undergone considerable development during recent years, particularly in the cases of sweet peas, clarkias, godetias, asters, stocks, and (not strictly annuals but generally treated as such) snapdragons. The development of sweet peas has been remarkable, and the number of varieties is now enormous, while cultivation as an exhibition flower has led to what is called cordon training, the plants being grown on single stems like cordon fruit trees. As regards most hardy annuals, however, the older, time-honoured principles of cultivation apply to-day: fertile deeply tilled soil, thin sowing, and subsequent timely thinning of the seedlings, so that the plants cannot get crowded and thereby become attenuated. Nevertheless, failures are not infrequent, because many growers sow too early in spring while the soil is still cold. However good and however finely raked the soil, however thin the sowing, failure is probable unless the soil has been warmed up by adequate spring sunshine. This applies to chalky as well as to clayey soils, because chalk does not warm up quickly. Sowing may be earlier, as a rule, on sandy loams than on either clay or chalk; in any case, local conditions should be considered. The class known as half-hardy annuals is best sown in pots, pans, or shallow boxes and shaded with glass and paper till germination has taken place, then gradually inured to light on a greenhouse shelf or near the glass in a frame. Abundance of air, careful watering (strictly avoiding excess), and timely pricking-out 3 to 4 in. apart in other boxes should then ensure sturdy and healthy plants, suitable for putting out in the garden when summer weather comes; or, at will, potted singly for greenhouse decoration. The following are selections of hardy and half-hardy annuals; detailed descriptions will be found in *The Wright Encyclopædia of Gardening*.

Hardy Annuals

<i>Abronia umbellata</i> ,	<i>Collomia bicolor</i> .
<i>Agrostemma ciliata</i> ,	<i>Courolavas major</i> .
rosea.	<i>Convolvulus minor</i> .
<i>Alyssum</i> , Sweet.	<i>Coreopsis</i> (see <i>Cal-</i>
<i>Bartsia aurea</i> .	<i>Hippias</i>).
<i>Calandula</i> .	<i>Cornflower</i> .
<i>Calliopsis Drum-</i>	<i>Eschscholtzia</i> , many
<i>mondii</i> .	vars.
<i>Candytuft</i> , many	<i>Evening primroses</i> .
vars.	<i>Godetia</i> , many vars.
<i>Chrysanthemum</i> ,	<i>Gypsophila elegans</i>
many vars.	<i>Helichrysum Jaco-</i>
<i>Clarkia</i> , many vars.	<i>bæa</i> .

Hardy Annuals—Cont.

Larkspurs, many vars.	<i>Nemophila insignis.</i>
<i>Lavatera rosea.</i>	Night-scented stock
<i>Leptosiphon.</i>	<i>Phacelia campanularia.</i>
<i>Linnanthes Doug. lnsii.</i>	Poppies, in var.
<i>Linnaria.</i> In var.	<i>Salvia, Blue Beard.</i>
<i>Linum grandiflorum</i>	<i>Saponaria, in var.</i>
Love-in-a-mist.	Scabious, in var.
Love-lies-bleeding.	<i>Silene, in var.</i>
Lupins, in var.	Sunflowers.
<i>Malope grandiflora.</i>	Sweet peas.
Mignonette, in var.	Sweet sultans.
Nasturtiums, in var.	Virginian stock.
	<i>Viscaria.</i>

Half-hardy Annuals (or plants commonly treated as such)

<i>Acroclinium</i> (Everlastings).	Maize, coloured.
<i>Antirrhinum</i> (Snapdragons), many vars.	Marigolds, Fr. and African, in var.
<i>Arctotis grandis.</i>	<i>Mimulus, in var.</i>
Asters, Chinese, many types and vars.	<i>Nemesia, in var.</i>
Balsams.	<i>Nicotiana affinis</i> and <i>Sanderæ.</i>
Carnations, Marguerite.	Pansies, in var.
<i>Celosia.</i>	<i>Petunia, in var.</i>
<i>Cosmea</i> or <i>Cosmos</i> , in var.	<i>Phlox Drummondii,</i> in var., & the <i>Hippoterum</i> (Everlastings).
<i>Dimorphotheca aurantiaca</i>	<i>Salpiglossis.</i>
<i>Dianthus</i> (Indian pink), in var.	<i>Schizanthus, in var.</i>
<i>Eccremocarpus scaber.</i>	<i>Statice sinuata.</i>
<i>Gaillardia</i> , in var.	Stocks, many types and var.
Golden Feather.	<i>Tulipa, signata</i>
<i>Lobelia</i> , in var.	<i>Verbenæ, in var.</i>
Zinnia, single and double, in var.	<i>Zinnia</i> , single and double, in var.

Biennials such as wallflowers, foxgloves, Canterbury bells, forget-me-nots, Brompton stock, and sweet Williams, suitable for sowing outside in May or June to flower the following year, should also be used.

Roses.—Wherever the atmosphere is reasonably pure, and the soil fairly substantial, roses can be grown successfully. A light dry soil is distinctly unfavourable, although some of the rambling W�huratalana roses will thrive in shallow chalky ground if well fed at the surface. The deeper, richer and more substantial the soil, the more likely roses are to thrive year after year. In poor ground frequent renewal will be necessary. Another great factor in maintaining health is to keep the plants free from injurious insects and fungi. Shelter without shade is desirable. Any time in open weather between Nov. and March is suitable for planting. On the whole bushes are more satisfactory than standards for beds, although the latter have their uses. Liberal use should be made of rambling roses for walls, fences, arbores, and pillars, and polyantha roses for bedding.

Kitchen Garden.—Productivity of a garden, especially the kitchen garden, rests on maintaining and improving soil fertility and structure. The three essentials are (1) organic manuring, (2) liming, and (3) fertilising.

Under cultivation the organic soil content is lost more quickly than it is replaced. In light soils this means loss in moisture-retentiveness; in heavy, loss in aeration; in all soils loss of humus, the chief reservoir of plant foods. The soil needs at least once every other year a dressing of organic manure. In the scarcity of farmyard and stable manure substitutes must be used, such as leafmould, peat, hop manure, shoddy, and compost. Organic compost consists of organic refuse (plant remains, leaves, mowings, etc.) and household refuse (kitchen waste, vacuum cleaner dust, etc.), scientifically rotted with an accelerator of decomposition. A common method is to heap the material in layers like a sandwich; thickish layers of mixed organic debris being interleaved with an accelerator (dung, nitrogenous chemical mixture, or proprietary compound), sprinkling of soil and lime, and left 4-12 months to decompose. Such compost is roughly equivalent to good farmyard manure, and a compost heap should be a permanent asset in every garden.

With few exceptions, notably rhododendrons, certain ericas, cranberries, strawberries, and raspberries, garden plants thrive best when there is adequate calcium (lime) in the soil. Lime also liberates other plant foods, and improves soil structure by causing the particles to flocculate. Sour clay soils benefit greatly from liming, so do acid sands, silt, and peat. Also some crops need more lime than others. Onions, beets, celeri, spinach, brassicas, lettuce, and leeks etc. as need a well-limed soil. Peas, beans, carrots, sweet corn, and runner beans need a moderately limed soil. Potatoes, tomatoes, turnips, marrows, cucumbers, and melons need very little or no lime except when grown in most acid soils. The type of lime used influences the amount. Ground limestone or chalk is used at rates of 1-2 lb. per sq. yd.; ground burnt lime or quicklime at 4-1 lb. per sq. yd., and hydrated lime at 4-1 lb. per sq. yd. The latter can be applied at any time of the year. Other times are best applied in autumn or winter. Fertilisers are necessary to make good soil deficiencies and to get increased yields. Briefly, fertilisers are designed to supply three major plant foods: nitrogen, phosphorus, and potash. The common nitrogenous fertilisers are: Inorganic or chemical—sulphate of ammonia (20·6 per cent), nitrate of soda (16·0 per cent), nitrochalk (15·5 per cent); Organic—dried blood (12·14 per cent), hoof and horn meal (14 per cent). Phosphatic fertilisers: Inorganic—superphosphate of lime (17·18 per cent), basic slag (9·18 per cent), triple superphosphate (40·48 per cent); Organic—steamed bone flour (27·5 per cent), bone meal (20·24 per cent). Potassic fertilisers: Inorganic—muriate of potash (50·60 per cent), sulphate of potash (48·5 per cent), kainit (14 per cent), potash salts (20·30 per cent), wood ash (2·5-6 per cent). Certain fertilisers contain more than one element, notably guano (10·14 per cent nitrogen, 9·11 per cent phosphorus), meat meal (3·7 per cent nitrogen,



YELLOW TURK'S CAP LILY

Lilium Pyrenaicum, one of the earliest lilies to bloom. Although it has a heavy strong smell, and has newer and more showy rivals, the peculiarly bright greenish yellow flowers with their dark vermilion anthers make it very pleasing.

Drawings by Miles Hadfield from "The Gardener's Companion"



ENGLISH GARDEN PINKS

From the earliest days the Dianthus has lived up to an old description as a genus furnishing plants of the herbaceous flower ornamental order. From left to right descendents, I. red pinks, I. light (rare of pinks) Alwoodii (the perpetual flowering pink), Alpine pinks show pink, village pinks, Scotch pink.

9-16 per cent phosphorus), and fish guano, (9-14 per cent nitrogen, 9-20 per cent phosphorus). Inorganic fertilisers are quickly exhausted; organic fertilisers tend to have residual effects for 2-4 years. The success of good fertilisation is to combine chemicals carrying the three major elements to suit the needs of the crop and the soil in which it is grown. Such combinations are known as 'complete' fertilisers. In practice deficiencies of other elements, many known as trace nutrients, may occur, and other chemicals be used to correct them. Borax, for instance, is used to correct a boron deficiency. In the well-tended garden however, unusual soil deficiencies are rare. One sided exhaustion of the soil, and susceptibility to insect pests and diseases in the kitchen garden, can be minimised by crop rotation. In practice, this means that like vegetables of the same plant family do not follow one another on the same ground. For instance, peas should not follow beans, tomatoes, potatoes, cabbage, cauliflower, and so on. For a four-year rotation the plots are four. No. 1 plot is cropped with

potatoes, No. 2 with peas, beans, onions, leeks, celery, No. 3 with root vegetables, No. 4 with brassicas and salads, the first year. In second year No. 1 is cropped as for No. 2, No. 2 for No. 3, No. 3 for No. 4, and No. 4 for No. 1. In subsequent years the cropping is rotated similarly, until by the fifth year the rotation begins again, as for the first year. There are some exceptions to rotation. Perennial crops like asparagus, and onions may be grown on the same soil for seven years. It is also permissible for swedes or turnips to follow carrots, since they are of different plant families. Insect pest and disease control are important aspects of vegetable growing, requiring some knowledge of their incidence and character, so that proper preventive or remedial measures can be taken. The chief preventive is good culture which fosters vigorous growth, robust health, and resistance in the plant. A short calendar of operations for the year follows.

January—Rough-dig all vacant ground when opportune. Lay stiff clay in ridges to be frosted. Wheel on organic manure,



AUTUMN FLOWERS

Crocus speciosus, so called from the showy orange stigmata, has the merits of being beautiful and hardy as well as plentiful. *Cyclamen hederifolium*, hardy autumn flowering, is not so widely known as it should be, and ivy, *Hedera Helix* variety *conglomerata*, a small, slow growing bush of deep green colour



WINTER BERRIES

The snowberry, *Symphoricarpos racemosus*, has been called the 'aspidistra of the shrubbery,' because of its tolerance of bad conditions. Its odd little flowers and white berries are attractive. *Hypericum elatum* is one of the few tall members of the genus, its dark fruits follow many small waxy flowers.

and spread. On sheltered border and in favourable weather make sowings of round peas and broad beans, and plant shallots and horseradish. Under glass start tomatoes, cucumbers, and melons in heat. Prepare hot-beds for early crops and mushrooms. Sow in boxes in frames leeks, onions, lettuce, and radish. Force rhubarb, chicory, seakale. Sow spinach and plant out lettuce under cloches. Make up seeds order. Treat vacant slug-infested ground with dry powdered Bordeau mixture (1 lb. per 20 sq. yds.)

February.—Continue winter cultivations when possible. Lime and apply slow-acting fertilisers, such as bone meal, basic slag, hoof and horn, etc. Put up seed potatoes in boxes in light, frost-proof quarters to sprout. Outdoors sow broad beans, parsnips, thyme and pot herbs, and parsley. Plant garlic, Jerusalem artichokes, and divide chives. In frames with gentle heat sow celery, onions, leeks, lettuce, Fr. beans, mustard and cress, and early cauliflowers. Plant out autumn-sown lettuce under cloches. Place cloches over early strawberries.

March—Prepare seed-beds out of doors, and fertilise with complete fertiliser 7–10 days before sowing. Outdoors sow brassicas (Brussels sprouts, cauliflower, cabbage, kale, Kohlrabi, etc.), spinach, onions, peas, leeks, turnips, carrots, and vegetables generally. Under glass in heat start celery, celeriac, angelica, marrows, capsicum (ardeoon), and tomatoes for outdoors. Divide artichoke roots. Clean and mulch asparagus bed. Transplant autumn-sown onions.

April—Weed seed-beds. Hoe frequently. Prepare marrow beds, celery trenches, and plant asparagus. Make successional sowings of salads, brassicas, roots, etc. Sow beet late in month. Under glass start sweet corn, marrows, runner beans, etc. Prevent onion fly with calomel dust, flea beetles with D.D.T., and slugs with crushed metaldehyde and food bait (bran). Thin out seedling crops, and prepare beds for transplanted brassicas.

May.—Complete potato planting. Stake peas. Protect tender crops from wind. Watch for late frosts on clear

nights after sunny days. Outdoors sow runner beans, Fr. beans, beet, sweet corn, and successions of peas, saladings, etc. Sow colewort and cabbage for autumn-cropping. Earth-up potatoes. Begin planting out marrows, tomatoes, and cucumbers late in month. Transplant malincrop brassicas for winter-cropping, and leeks. Check early aphides with nicotine or derris insecticide. Use quick-acting fertiliser, such as dried blood, nitrate of soda, to feed leafy crops. Cut asparagus. Train cucumbers under glass.

June.—Hoe to control weeds, but mulch growing plants to conserve moisture, using rotted compost, peat, sawdust, etc. Plant out cabbage, tomatoes, ridge-cucumber, marrows, and capsicums out of doors. Sow vegetables and saladings for succession. Cease cutting asparagus. Continue earthing-up potatoes. Sow parley for winter use, and early peas for autumn cropping. Prevent cabbage-root fly with calomel dust. Dust brassicas with derris or D.D.T. to prevent caterpillar attacks. Control thrips on peas with nicotine. In greenhouse, ventilate to keep even temps. Shadō glass in very hot weather.

July.—Cultivate ground cleared of early crops, and prepare for winter greens. Mulch against drought. If you must water use a weak liquid manure solution. Sow turnips and beets after peas. Feed celery, globe artichokes, etc. Stake outdoor tomatoes. Take up shallots and garlic. Sow runner beans, early cabbage, prickly spinach, and salads for succession. Lift early potatoes. Spray malincrops with copper fungicide to prevent blight. Cut herbs for drying.

August.—Sow spring cabbage, cauliflower, kale, endive, winter lettuce, yellow turnip, colewort, and onions for overwintering. Lift early beets and carrots for storing. Earth up celery. Spray potatoes again against blight with copper fungicide. Disbud tomatoes and restrict to four trusses out of doors. Cut down globe artichokes and mulch with manure. Bend over tops of maturing onions. Under glass make sowing of Fr. beans, tomatoes, and cucumbers for winter fruiting.

September. Lift and ripen off onions. Begin harvesting potatoes, roots, etc. Dry herbs. Earth up leeks and celery. Lift chicory for blanching. Prevent weeds seedling. Transplant lettuce in frames for winter. Under glass sow quick-maturing carrots. Thin spinach. Plant out endive, spring cabbage. Sow corn salad in frames. Use derris and D.D.T. to deter caterpillars on brassicas. Dust with sulphur against mildews.

October.—Complete harvesting and storing of roots and potatoes. Lift sulphy and scorzonera. Trench and manure vacant ground. Sow cauliflower for wintering in frames. Under cloches sow lettuce (May King, Cheshunt Early Giant). Replant watercress beds. Remove decaying foliage of brassica crops from soil promptly. Make up compost heaps of plant debris. Make first sowing of broad beans in south.

November.—Early digging and trenching of vacant ground should go hand in hand with organic manuring and liming. Treat pest-infested soil with soil fumigant. Plan next year's rotation. Broad beans (Seville and Claudia Aquadulce) and round peas may be sown. Lift asparagus for forcing. Plant horseradish. Cover seakale and rhubarb with organic litter for forcing.

December.—Plant perennial vegetables, such as seakale, asparagus, etc. Protect celery from frost. Divide mint bed. Look over stored potatoes, carrots, etc., periodically, and remove diseased tubers; treat with synthetic hormone product to prevent premature sprouting. Clean up vegetable plots; hoe spring cabbage, etc.; overhaul potting shed and equipment. Rough-dig vacant ground. Under glass sow early horn carrots. If heat available begin sowing tomatoes for next summer cropping.

Fruit.—Fruits succeed on a wide range of soils given good root aeration and adequate but not too free drainage. Heavy soil needs to be lightened by use of basic slag or lime and organic material. Light soils need liberal manuring, mulching, and special attention to potash content. Aspect should be open, preferably southerly. Site must be frost-free. Fruit does better on hillside or slope than in valleys or frost pockets. Modern tree fruits are grown on selected rootstocks which modify growth and fruiting habit. Standards, planted 20-40 ft. apart, and half-standards, planted 18-25 ft. apart, are best for orchards, specimen planting, and long yields. For small gardens pyramid and bush trees, planted 12-15 ft. apart, and cordons, plan'ted 2-3 ft. apart, are best. In stone fruits, trained wall trees are best, not cordons. Apricot, nectarine, and peach are usually grown as trained wall trees, but as bushes in warm dists. Medlars and nut^ts, planted 10-18 ft. apart, are useful. Soft bush fruits, such as currants and gooseberries, need 4-6 ft. apart. In rows 6-8 ft. apart, and blackberries, loganberries, and other hybrid berries are trained on wire fences 10-12 ft. between plants, and 6 ft. between rows. Strawberries are best planted separately, 12-18 in apart, in rows 2½-3 ft. apart. Planting of all fruits can be done from Nov. to Mar. in mild open weather. Trees should be staked at time of planting; soil rammed firm around their roots; and a mulch of organic litter applied.

Manuring.—A good general plan is annual application of organic manure (dung, compost, hop manure, etc.), especially to raspberries, strawberries; application of bone meal (2-3 oz. per sq. yd.) or basic slag (4-6 oz.) every second or third year; to all fruits. Dessert apples, red currant, and gooseberries need potash most, and should get 1½ oz. sulphate of potash and 1 oz. sulphate of ammonia per sq. yd. in March. Cooking apples, pears, raspberries, bramble fruits, and strawberries need 1 oz. sulphate of potash and 2 oz. sulphate of ammonia; while stone fruits black currants, and nuts respond to ½ oz.

sulphate of potash with 2 oz. sulphate of ammonia per sq. yd. in spring.

Pruning.—It is impossible to detail the various systems of pruning followed here, but the basic principle for fruit-tree pruning is severe pruning encourages shoot or wood growth, light pruning encourages development of fruiting wood. It follows that where new wood growth is wanted, as in training trees in early years, pruning should be severe. This is true in the case of the trained trees of Morello cherry, apricot, and peach, where new wood is needed each year to replace old. But once the framework of apples, pears, plums, sweet cherries has been built up, pruning should be light to encourage bearing. Generally, the weaker the year's growth the harder it may be pruned in winter. Summer pruning consists of tipping leading shoots in Aug. to help new wood growth to mature. Bearing trees generally need light pruning, thinning of crossing branches, and removal of dead wood. Care is needed as some trees bear on the tips of young shoots. Red currants are pruned like apples or pears. Black currants are pruned by removing about a third of the oldest branches at their base each year, letting new shoots take their place. gooseberries in 3 or 4 pruned like black currants, or like red currants, especially if cordons. Raspberries are pruned by cutting away the fruited canes at the soil level each Nov. Non-fruiting apples and pears often respond to bark-ring (removal of narrow $\frac{1}{2}$ in. ring of bark in two half circles, 2 in. apart) in May. Plums, damsons, and stone fruits which fail to crop may respond to root-pruning, the roots being bared around the trees in winter, and all coarse roots 2–3 ft. from the stem severed.

Spraying.—Adequate control of insect pests and fungus diseases depends upon preventive spraying. All tree and bush fruits should be sprayed with a winter wash (tar oil, D.N.C. petroleum oil, or thiocyanate) while dormant, to kill eggs of aphids, etc., and to clean trees of moss and lichen. In spring there should be at least one pre-blossom and one post-blossom application of lime-sulphur to control scale and other fungus diseases, to which may be added an insecticide (lead arsenate, D.D.T., or nicotine) to control such pests as caterpillars, capsid bug, etc., in apples and pears. Black currants need lime-sulphur in early April to destroy big bud mite. Derris, nicotine, lanchocearpus dust, and petroleum oil are used for contact control of insects in summer, while sulphur fungicides are used for mildews.

Choice of Fruits.—Fruit varieties are propagated vegetatively. It is important to begin with healthy, vigorous stock of good strain from reputable growers. **Apples:** Dessert—Tydemar's Worcester, Beauty of Bath, Worcester Pearmain, Epicure, James Grieve, Ellison's Orange, Lord Lamourne, Cox's Orange Pippin, Blenheim Orange, Laxton's Superb, Winter King. Culinary—Enneth Early, Grenadier, Golden Noble, Lane's Prince Albert, Bramley's Seedling, Lord Derby, Edward VII., Crawley Beauty. **Pears:** Dessert—

Clapp's Favourite, Laxton's Superb, Williams's Bon Chrétien, Beurré Superfin, Dr. Jules Guyot, Beurré Hardy, Conférence, Durondeau, Doyenne du Comice, Winter Nelis. Culinary—Beurré Clairgeau, Pittman Duchess, Vicar of Winkfield, Cattillac, Uvedale's St. Germain. **Apricots:** Breda, Moorpark, Royal, Shipley's. **Cherries:** (plant in pairs) Elton Heart and Florence; Early Rivers and Waterloo. Bigarreau Napoleon and Governor Wood; Black Tartarian and Elton Heart. Bigarreau Schrecken and Monstrueuse de Mezel; Belle d'Orléans and Frogmore Early. **Plums:** Blairstown Rd., Belle de Louvain, Czar, Deuniston's Superb, Early Laxton, Jefferson, Kirk's Blue, Victoria, Purple Pershore, Giant Prune, Transparent Gage. **Damsons:** Merryweather, Fairleigh, Black Currants—Boskoop Giant, Mendip Cross, Seabrook's Black, Baldwin, Triple A, Cotswold Cross, Victoria, Davison's Eight. **Red Currants:** Laxton's No. 1, Raby Castle, Laxton's Perfection, Fay's Prolific. **White Currants:** White Dutch, White Transparent. **Gooseberries:** Careless, Lancer, Whinham's, Warrington, Whitesmith, Lancashire Lad, Leveller. **Raspberries:** Lloyd George, Norfolk Giant, Pyne's Royal, Red Cross, Malling Promise, Golden Hornet. **Strawberries:** Royal Sovereign, Paxton, Tardive de Léopold, Giant Prolific.

Market Gardening, including French Gardening—Increased population, and consumption of fruit and vegetables, and the food situation during and after the Second World War have encouraged great developments in commercial cultivation. With competition from imports from abroad increasing, however, successful market gardening with economical and intensive cultivation demands skill, knowledge, and first class equipment. With adequate glass-houses, Dutch lights, and cloches the skilful home grower can produce quality food, and should be able to bring produce to maturity early enough for profitable return. Capital outlay for a 10-ac. holding is between £600 and £1,000. At least one car should be spent working on an existing holding, and it is wise to take one year's instructional course at a co. farm institute beforehand. Site, soil, water supply, accessibility, and markets are the important considerations to be studied. If G. demands considerable equipment, and capital outlay may approach £1,500 per ac.

See also BOTANY; BULBS; FERNS; FLORA; FLOWERS, FLOWER SHOWS; FRUIT; GARDEN ART; GRAFTING; HERBS; HOTHOUSE; HYDROPONICS; INSECTS; LAWNS; LOAM; PLANT HORMONES; PLANTS; PRUNING; SHRUBS; SOIL; VEGETABLES; WINDOW GARDENING.

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Garden, 1937; M. B. Crane and W. J. C. Lawrence, *The Genetics of Garden Plants*, 1939; N. B. Bagenal, *Fruit Growing*, 1939; R. Bush, *Fruit Growing Outdoors*, 1946; and *Frost and Fruitgrowing*, 1945; A. J. Simons, *Vegetable Grower's Handbook*, 1945; S. B. Whitehead, *Gardener's Earth*, 1945, *The Winter Garden*, 1948, *In Your Kitchen Garden*, 1948, *In Your Flower Garden*, 1948, and *Garden Weeds and Their Control*, 1949; and J. L. H. Chase, *Cloche Gardening*, 1946.

Garden of the Gods, dist. of Colorado U.S.A., in the vicinity of Colorado Springs. It covers about 500 ac., and is remarkable for its strange and extremely beautiful formations of rock, some of which resemble in form cathedral spires, etc.

Gardiner, Alfred George (1865-1948), Eng. journalist and essayist, b. at Chelmsford. Son of Henry James G. wrote under the pen-name 'Alpha of the Plough.' He was editor of the *Daily News* from 1902 to 1919. His *Prophets, Priests and Kings* (1908) is a series of caustic character sketches of contemporary celebrities, notably politicians. It was followed in 1913 by *Pillars of Society* in a similar vein and by *War Lords* in 1915. He produced a biography of Sir Wm. Harcourt in 1922, and one of George Cadbury, formerly proprietor of the *Daily News*, in 1923. A pleasant, vivid pen.

Gardiner, James, Colonel (1683-1745), Scottish soldier, b. at Carriden, Linlithgowshire. He was an officer of dragoons and was noted for his bravery. He was severely wounded at Ramilles and, in 1715, took part against the Jacobites in the rising of that year. He became colonel of the Inniskillens and fought at the battle of Prestonpans. Here he was deserted by his men and slain fighting.

Gardiner, Samuel Rawson (1829-1902), Eng. historian, b. at Ropley, Hampshire, and educated at Winchester, Christ Church, Oxford, at Edinburgh, and at Gottingen. He was elected fellow of All Souls' College, Oxford, in 1884, and of Merton in 1892. He held the position of prof. of modern hist. at King's College London, until 1885. From 1886 to 1889 he was examiner in hist. at the univ. of Oxford. He was granted a civil list pension of £150 a year in 1882. G. belongs to the new school of historians who confine themselves to facts, putting aside partisanship and brilliant rhetoric. He has thrown a new light on the Stuart period, to which he devoted years of patient research, often among documents hitherto unstudied. His works include *The Thirty Years' War* (1874), *History of England from the Accession of James I. to the Outbreak of the Civil War* (1883), *Students' History of England* (1890, repub. with continuations, 1920), *History of the Great Civil War* (1893), and *Oliver Cromwell* (1899). See H. B. Learned, S. R. Gardiner, 190^o, and R. G. Usher, *A Critical Study of the Historical Method of S. R. Gardiner*, 1915.

Gardiner, Stephen (c. 1493-1555), Eng. prelate who became bishop of Winchester and lord chancellor. In 1520 he was made master of Trinity Hall, Cambridge, where he had studied law. He became

also secretary to Wolsey, and having thus access to Henry VIII., he gained that monarch's favour by supporting his designs. He was sent to try to secure the pope's consent to the divorce of Catherine of Aragon, and later he conducted the case against the queen. He then became successively archdeacon of Norwich, archdeacon of Leicester, secretary of state, and bishop of Winchester. He has been looked upon as a bloodthirsty 'seeker-out of reformers,' and certainly he was zealous and consistent, but it is now established that he tried to save the lives of Cranmer and others, and that he was against the persecutions of Mary's reign. Facts seem to prove that he has been much maligned by inaccurate accounts, and that he was not the self-seeking ambitious man whose one aim was to become cardinal and archbishop of Canterbury. He remained faithful to his religion and suffered long imprisonment under Edward VI. In Mary's reign he was reinstated and made lord chancellor. He encouraged learning and wrote *On Obedience, Explication and Assertion of the True Catholic Faith touching the most blessed Sacrament of the Altar* (1551).

Gardiner, city of Maine, U.S.A., in the Kennebec co. It is situated on the Kennebec R., 8 m. S.E. of Augusta. The river is navigable by large vessels as far as this. It possesses a high school, public library, and city hall. The manufs. are paper, shoes, etc., and there are saw-mills, machine shops, and flour-mills. The chief exports are lumber and ice. Pop. 6400.

Gardner, Ernest Arthur (1862-1939), Eng. archeologist, b. in London. From 1887 to 1895 he was director of the Brit. School of Archaeology in Athens. Yates prof. of archaeology, Univ. College, London, 1896-1929. He wrote *Ancient Athens* (1902), *A Companion to Greek Studies* (1905), *The Inscriptions of Attica* (1905), *Six Greek Sculptors* (1910), *Religion and Art in Ancient Greece* (1910), *The Art of Greece* (1925), and *Greece and the Aegean* (1933).

Gardner, tn. of the U.S.A., in the co. of Worcester, Massachusetts, and 24 m. N.W. by N. of Worcester city. There are manufs. of toys, baby carriages, silver goods, etc., and it possesses the largest chair factory in the world. Pop. 20,200.

Gare-fowl, or Great Auk (*Icelandio* *Geirfugl*, Gaelic *Gearbhul*), large sea-bird of the family Alcidae, the *Alca impennis* of Linnaeus, similar in appearance to the razor-bill (*Alcatorda*). It inhabited the N. hemisphere (temperate region of the N. Atlantic), and has been extinct since 1844, owing to the ruthless trade in its eggs and skin. The G.s. had wings so small that it was impossible for them to fly, but they were good swimmers. The chief breeding places were skerries off the coast of Iceland, Funk Is. off Newfoundland, and Spitzbergen. See S. Grove, *The Great Auk*, 1885, and J. Milne, 'Relics of the Great Auk,' in the *Field*, 1875.

Gareloch, inlet of the Clyde, situated in the S.W. of Dumbartonshire, Scotland. It is about 7 m. in length, and has an average width of a mile. The steamers

built in the Clyde shipbuilding yards are frequently brought here for the purpose of testing their compasses. The vil. of Garelochhead is a holiday resort.

Garfield, James Abram (1831-81), president of the U.S.A., b. at Orange, Ohio, and was forced, owing to the death of his father, to earn his own living at a very early age. He, however, did not neglect his education, and went to Hiram College, Ohio, and from there to Williams College, Massachusetts. He graduated at the latter place and then went back as a prof. to his old college. Of this he ultimately became president, and he still continued to study law and to practise. On the outbreak of the civil war he was appointed to command a volunteer regiment, and by his gallantry and ability quickly raised himself, until he was appointed a major-general. In 1863 he resigned his command and entered Congress, where he was quickly recognised as one of the leaders of the Republican party. He retained his seat in Congress until 1880, when he was put forward as the Republican candidate for the presidency. He was elected and took up office in March 1881. He identified himself with the movement for the reform of the civil service and alienated in this way many of his supporters. In July of the same year he was shot by a disappointed fanatic who had unsuccessfully sought office and d. in Sept. His speeches were collected into 2 vols. in 1882. See W. M. Thayer, *From Log Cabin to White House*, 1881, and T. C. Smith, *Life and Letters of James A. Garfield*, 1925.

Garfield, bor. of New Jersey, U.S.A., in the co. of Bergen. There are woollen mills and chemical works, also manufs. of clothing, paper, and essential oils. Pop. 28,000.

Garfish, see BONY PIKE.

Gargano, peninsula in the E. of Italy, in the prov. of Foggia. It extends into the Adriatic Sea for about 31 m., and is from 15 m. to 30 m. in breadth. Monte Calvo is a summit which rises to a height of 5295 ft. and is composed chiefly of limestone. The head of the peninsula is Testa del G.

Gargantua, see RABELLAIS.

Gargle. The original or proper meaning of this word was a throat wash, but, as commonly used, it indicates a wash for both the mouth and throat. It is used by working the liquid round the mouth and allowing it to trickle down the throat, while the air is driven out of the lungs to prevent the fluid going the wrong way. Gs. may be composed of hot or cold water, either plain or flavoured, such as barley water or orange-flower water. They may also be of glycerine, plain or medicated with alum, iron, tannin, or carbolic acid.

Gargoyle, projecting spout on a building, designed in the shape of a grotesque monster, to carry the water from a gutter clear of the masonry. Among famous Gs. are those on the cathedral of Notre Dame, Paris.

Garhmukhtesar, tn. of India, in the United Provs. It is situated on the r. h. of the Ganges in the dist. of Meerut. The

inhab. are Hindus, with about 25 per cent Muslims. Pop. 8000.

Garhwal: 1. N. dist. of the United Provs., India. In 1803 it was ruined by the Gurkhas, who had overrun it, but in 1814 it was taken by Britain and there-after prospered considerably, largely on account of its extensive tea plantations. Pop. (1941 census), 602,115. 2 (Tehri-Garhwal). Former small state separated from the dist. of G. by the Alaknanda R., which remained in the possession of its rajah until 1949. The prevailing religion is Hindu. In March (1949) the Gov. of India announced its intention to integrate Tehri-Garhwal and one or two other states either with the United Provs. or the E. Punjab. Area 4516 sq. m. Pop. (1941) 397,360.



GIUSEPPE GARIBALDI

Garibaldi, Giuseppe (1807-82), It. patriot, liberator, and guerrilla leader, b. at Nice. A sailor's son, he took to the sea, commanding a brig by 1830. At this time (c. 1833) he became acquainted with Mazzini and the leaders of Young Italy, and was fired with enthusiasm for the It. national movement. For his share in the outbreak at Genoa (1834) he was obliged to flee to France. He then sailed to S. America, and there offered his services to the republic or prov. of Rio Grande do Sul, which was in revolt against the emperor of Brazil. He distinguished himself as a guerrilla warrior but was taken prisoner and suspended for two hours by the wrists for trying to escape. Soon afterwards he eloped with and married a beautiful creole, Anita Riveira de Silva, the companion of his E. campaigns and the mother of his children, Menotti, Ricciotti, and Teresa. In 1842 he offered

his help to the Monte Videans (1836-48) against the Argentine dictator, Rossas. He gives a full account of his various exploits in S. America in his autobiography.

Returning to Europe, G. took part in the campaign against the Austrians and Fr., and was the soul of the revolutionary gov't at Rome. Obliged eventually to retreat to San Marino G. was forced to land before reaching Venice, and his wife perished from exhaustion and exposure in his arms. In 1850 he went as an exile to U.S.A., living for a time in Staten Is. In 1854 he returned and settled in Caprera Is., near Sardinia, eagerly noting the results of Cavour's policy in Italy. He fought for Sardinia against Austria in 1859 and protested against the cession of Nice and Savoy to Napoleon III. in 1860. After the peace of Villafranca, secretly supported by Sardinia's request, G. organised an expedition against the Sicilies, in the hope of bringing about the union of Italy. This is perhaps his most famous undertaking. He landed at Marsala with his 'thousand volunteers' defeating the Neapolitan troops, which far outnumbered his own, at Calatafimi, and thus opened the way to Palermo. G. became dictator of Sicily, and crossing to Italy expelled Francis II. from Naples and entered the city in triumph. When Victor Emmanuel, king of Italy, appeared with his Sardinian troops in the kingdom of Naples, G. delivered up to his sovereign his army and absolute sway over the Neapolitan provs., retiring to Caprera in 1860. He was severely wounded at Aspromonte (1862), fighting against the royal troops, and taken prisoner, but pardoned shortly afterwards. On his second attempt to oppose the papal power (1867) he was utterly defeated by the papal and Fr. troops at Mentana, but was allowed to return to Caprera. In 1870-71 he attempted to help the Fr. Republic against the Gens., commanding the Fr. volunteers in Burgundy. He entered the It. parliament in 1874, finally consenting to accept an ann. pension from it. G. wrote the novels *Cletia* (1870) and *Cantoni il volontario* (1870), but had little literary talent. See memoirs (trans. by A. Werner in 1889 as *Autobiography of G. Garibaldi*); A. Mario, *Garibaldi e i suoi Tempi*, 1884; J. Marriott, *The Makers of Modern Italy*, 1889; G. Stiavelli, *Garibaldi nella letteratura italiana*, 1901; Sir G. O. Trevelyan, *Garibaldi and the Thousand*, 1908; and P. Fischauer, *Garibaldi: Der Mann und die Nation*, 1934.

Garibaldi, Giuseppe (b. 1879), It. general, b. at Melbourne; grandson of the great Giuseppe G. (q.v.) and eldest son of Gen. Ricciotti G. (1847-1924), under whom he fought in Greco-Turkish war of 1897. Fought also in S. African war; lived in S. and Central America and in Balkans. Early in the First World War he raised an It. legion of 14,000 which fought for France on the Argonne. In 1915 he enlisted in Italy, where he became an officer in the Fourth Army. Commanded the Alpine brigade in France,

1918; became brigadier-general. Resigned June 1919. In 1921 he organised the Free Italian Association against Fascism. Afterwards went to New York.

Garlep, see ORANGE RIVER.

Garigliano, riv. of S. Italy which has its source in Abruzzi, and empties itself into the Mediterranean at the gulf of Gaeta. The Eighth and Fifth Brit. and Amer. Armies in their offensive against the Ger. Gustav line crossed the G. on May 12, 1944. See ITALIAN FRONT, SECOND WORLD WAR CAMPAIGNS ON.

Garland, Hamlin (1860-1940), Amer. author, b. W. Salem, Wisconsin. Worked on mid-W. farms. In his realistic novels and short stories he took as his themes the lives of the people on the prairie farms, which he depicts as a narrow and monotonous fight for existence. Awarded the Roosevelt Memorial Association gold medal for literature, 1930. Among his many vols. some of the best are *Main Traveled Roads* (1890), *Prairie Folks* (1892), *The Book of the American Indian* (1923), *The Trail-makers* (1926), *Roadside Meetings* (1930), *My Friendly Contemporaries* (1932), *Forty Years of Psychic Research* (1936), and *The Mystery of the Buried Crosses* (1938).



GARLIC

B, bulb.

Garlic, or *Allium sativum*, liliaceous plant which grows wild in S. Europe, especially in Sicily. It is a hairy perennial with bulbous roots, which are much used in cookery and occasionally in medicine.

Garlic Pear, see under CRATEVA.

Garm, region of the Tadjik, S.S.R., Soviet Central Asia.

Garment Design, see under DRESS-MAKING.

Garnet, Henry (1555-1606), Eng. Jesuit. He was educated at Winchester, studied law, became a Roman Catholic, went to Italy, where he joined the Society of Jesus and acquired a reputation for scholarship, then returned as provincial of the Jesuits

in England. He was tried on suspicion of being implicated in the Gunpowder Plot and found guilty, possibly on insufficient evidence, but his zeal in furthering schemes in connection with his order no doubt weighed against him, and he was hanged.

Garnet, name of a group of closely related minerals, which crystallise in the cubic system, usually in rhombic dodecahedra or in icositetrahedra, with imperfect cleavage. The chemical composition and hardness vary. Gs. are a good example of an 'isomorphous' group. They are found in crystalline schists, gneiss, metamorphic limestones, granite, serpentine, and sometimes in volcanic rocks and veins. Their usual colour is red, but there are brown, yellow, green, and black varieties. Of the semi-precious stones used in jewellery, some of the best known are the pyrope or anct. 'carbuncle' (red) from Saxony and Bohemia, the almandine (bluish-red) from Ceylon, Burma, Pegu, Brazil, and Scotland, and the uvarovite (green) from the Ural Mts. (Siberia) and Canada. Fine red specimens somewhat resemble rubies in appearance, but common Gs. have many flaws. The 'Syrian' Gs. most esteemed in commerce came originally from Syria in Pegu, and sometimes resemble oriental amethysts in colour. Besides being cut as gems, Gs. are used for abrasive and other purposes, G.-paper being a substitute for sand-paper, especially in America.

Garnett, David (b. 1892), Eng. novelist, b. at Brighton, Sussex, the son of the author, Edward G. (1868-1937), and Constance G., who is celebrated for her trans. from Russian literature. His grandfather was Richard G. (q.v.). G. was privately educated, and then went to the Royal College of Science, where he studied botany. During the First World War he worked with the Friends' War Victims' Relief. In 1922 his first novel was pub. *Lady into Fox*, a story with an original theme which made his reputation. It was awarded the Hawthornden prize and the James Tait Black Memorial prize. Two years later he followed up his success with *A Man in the Zoo*. From 1928 to 1932 he was closely concerned with the work of the Nonesuch Press, acting as literary adviser. Meanwhile he continued to write. *The Sailor's Return* appeared in 1925; *Go She Must* in 1927; *The Old Dovecote and other Stories* in 1929, and *No Love* in 1929. His themes, blending fantasy and reality, are treated with humour and imagination, for which he employed a clear and simple style. Having learnt to fly (see *A Rabbit in the Air*, 1932), he served with the R.A.F. during the Second World War. His *War in the Air* was pub. in 1941. After the war he returned to publishing. Other books include *The Grasshopper Come* (1931); *A Terrible Day* (1932); *Pocahontas*; or, *The Nonpareil of Virginia* (1933); and *Beany-Eye* (1935). In 1938 he ed. the letters of T. E. Lawrence.

Garnett, Richard (1835-1906), Eng. writer and librarian, son of Rev. Richard

G., the philologist and one-time assistant keeper of printed books at the Brit. Museum. He was b. at Lichfield, Staffordshire, and in 1851 was appointed assistant in the reading-room of the Brit. Museum, becoming its superintendent in 1875. From 1881 to 1890 he had charge of the preparation of the great catalogue of authors, resigning his post of superintendent in 1884 in order to give all his time to this exacting labour. He introduced the 'sliding press' into the library. He was keeper of the printed books from 1890 to 1899, having been already appointed assistant keeper in 1875. Among his works are *History of Italian Literature* (1897); *Essays of an Ex-Librarian* (1901); *An Illustrated Record of English Literature* (with Sir Edmund Gosse), 1903-4; and his lives of Carlyle (1887), Emerson (1888), Milton (1890), Dryden (1895), Coleridge (1904), Tennyson (1906), contributed to the Great Writer series. His poems and plays include *Primula* (1858), *To Egypt* (1893), and *William Shakespeare, Pedagogue and Poacher* (1901). Among his other works are *The Twilight of the Gods and other Tales* (1888) and *Essays in Librarianship and Bibliography* (1899). G. contributed many articles to the Ency. Brit.

Garnier, Jean Louis Charles (1825-98), Fr. architect, b. at Paris. At the age of twenty-three he won the Grand Prix de Rome. He spent the next few years travelling in Italy and Greece. He returned to Paris in 1853, having already estab. a great reputation on the Continent. He was not in very affluent circumstances until, in 1861, in open competition, he proved successful with his design for a grand opera house for Paris. The work was not finished until 1875. Amongst other great buildings which he designed are the Casino at Monte Carlo and the Hôtel du Cercle de la Librairie at Paris. He was made a grand officer of the Legion of Honour in 1895. Throughout Europe he was recognised as the greatest architect of the age. See L. G. B. P. Larroumet, 'La vie de Charles Garnier,' in *L'Ami des monuments français*, 1904-5.

Garnier, Marie Joseph François (1839-1873), Fr. officer and explorer, b. at St. Etienne. In Cochin-China he served under Adm. Charner. He was the leading spirit in the journey of exploration which was undertaken nominally under the superintendence of a superior Fr. officer but really under the direction of G., who was responsible for nearly all the observations made in a country which had previously been practically unknown to Europeans. The journey was undertaken from Kratie to Shanghai. In 1873 he undertook the founding of a Fr. protectorate in Tonking. He captured the cap., but was slain in subsequent fighting.

Garnier, Robert (c. 1545-1600), Fr. poet, b. at Ferté-Bernard. He became a law student, and whilst studying law wrote his first poem, which gained him a prize in the *prix floraux* at Toulouse. He was held to be a great orator and was, even in his own generation, recognised as a poet of more than ordinary merit. Amongst the

chief poems which he wrote may be mentioned *Porcée* (1568), *Hippolyte* (1573), *Antigone* (1580); *Bradamante* (1582), and *Les Jures* (1583).

Garnierite, nickel containing mineral occurring in New Caledonia. G is double silicate of nickel and magnesium, containing 24 per cent of the former metal. Its formula is $2(\text{Ni Mg})_2\text{Si}_2\text{O}_5 \cdot 3\text{H}_2\text{O}$. It is worked upon a large scale in France for the preparation of nickel.

Garnishee, person in whose hands money or property belonging to a debtor or defendant has been attached at the suit of a creditor or plaintiff, and who has had warning or notice of such attachment (*q.v.*). A G., after receipt of such notice, must not part with the debtor's money or property except to answer the creditor's claim or until the attachment is dissolved. But there can be no execution against a G. in respect of such property unless there has been a judgment entered against the principal debtor, and, further, a G. is entitled as against the creditor or plaintiff to set up the rights of third parties to whom he himself is under some liability in respect of the property.

Garofalo, see *Tisi, BENVINTURO*.

Garo Hills, mountainous dist. of India situated southward of Brahmaputra and to the W. of Assam forming its SW corner. The mts rise to a height of 4650 ft. above sea level, and have the appearance of parallel ridges, with deep valleys between. The dist covers an area of 3270 sq m., and the inhab. the tribes are a strong and energetic race, darkish brown in colour. The exports are cotton and forest products. Large quantities of coal and petroleum are to be found in the hills. The administrative headquarters are at Tura. Pop about 200,000.

Garonne, riv. of France, which rises in the vale of Agen, on the N. side of the Pyrenees. Its course is generally N. W. Flowing through France, it passes the dpts of Haute Garonne, Tarn et Garonne, Lot et Garonne, and Gironde. Its trib. are the Save, Gers, Tarn, Lot, and Dordogne. Below Bordeaux it is known as the Gironde. The riv. is navigable to Toulouse from Boussens. After a course of 400 m. it enters the Atlantic.

Garonne, Haute, dept. of SW France formed from parts of Languedoc and Gascony, and divided into three arronds Toulouse, Muret and Saint Gaudens. Cap Toulouse. Area 2457 sq m. The S. is very mountainous containing some of the highest peaks of the Pyrenees, including Mt Pardiguero (10,560 ft.). The intervening valleys are very fertile. The centre of the dept. is formed by a hilly plateau, with an altitude of 1150-1500 ft. Chief riv., the G. with its trib. the Pique, Save, Salat, Vige and Hiers. Oats, maize, beans, vines and wheat are grown. Iron, marble and rock salt are mined, and there are mineral springs. Pop. 512,200.

Garos, see under *GARO HILL*.

Garrett, João Baptista de Almeida, see *ALMEIDA-GARRETT*.

Garrick, David (1716-79), Eng. actor and playwright, descended on his father's

side from Huguenot refugees called De la Garrigue. He was educated at Lichfield Grammar School and partly under Dr Johnson, with whom he came to London about 1737. He studied at Lincoln's Inn, and set up in the wine trade with his brother for a time, but soon gave up both



DAVID GARRICK

for the stage. His first public appearance was at Ipswich in 1741, in *Oriental*. Later in the year he appeared in his famous role of Richard III. He went over to Dublin twice becoming joint manager with Sheridan in 1745, and roused much enthusiasm there. Don Felix in *The Wonder* was one of G.'s favourite parts, first played in 1750 and also at his last performance, 1776. In 1747 G. and Lucy were joint managers of Drury Lane Theatre, and G. continued in this office till his retirement (1776). In 1749 he married the Vicarage *dameuse* Mlle Violette. Quarrels among members of his company led to the famous rivalry between Drury Lane and Covent Garden, most of his performers joining the opposition house. In 1750 *Romeo and Juliet* was acted by G. and Mrs. Bellamy at Drury Lane, and by Springer Barry and Mrs. Cibber at Covent Garden. Drury Lane, however, triumphed in the end. In 1769 G. conducted a notable jubilee in Shakespeare's honour at Stratford-on-Avon. He did much to restore the original form of that great dramatist's plays and do away with the altered versions then in common use. With him ended the old custom of admitting spectators on the stage itself and he introduced various other reforms. With Goldsmith, Johnson, Burke, and others he was a member of the Literary Club. Among his comedies and farces are *The Young Foal* (1741); *Lethe* (1745), *High Life below Stairs* (1759), and *The Clandestine Marriage* (1766). Selections of his dramatic works were brought out in 1768 and 1798. One of Sir Charles Wyndham's great parts was that of David Garrick in the play of that name (adapted from the Fr. *Sullivan* by Robertson), the last revival being at his theatre in 1900. See T. Davies,

Memoirs, 1780; J. Boaden (ed.), *The Private Correspondence of D. Garrick*, 1831-1832; F. Hedcock, *A Cosmopolitan Actor: David Garrick and his French Friends*, 1912; C. R. Williams, *David Garrick, Actor-Manager*, 1929; H. P. Stein, *David Garrick, Dramatist*, 1938; and lives by P. Fitzgerald, 1868; J. Knight, 1894; A. Murphy, 1901; C. Gaehde, 1904; D. MacMillan, 1934; and Margaret Barton, 1948.

Garrick Club, social and dramatic club which was named after the famous actor and dramatist of the eighteenth century. It was founded in 1831, its avowed objects being 'the general patronage of the drama, and the formation of a theatrical library, with works on costumes, making-up, etc.' The entrance fee is 20 guineas, and the ann. subscription is 15 guineas; membership is most exclusive, only the most successful actors and playwrights gaining admittance. The club possesses a collection of more than 600 theatrical portraits and other pictures, and numerous theatrical relics. It is situated in a magnificent building, at 15 Garrick Street, W.C.2. See G. Boas, *The Garrick Club*, 1948.

Garrick Theatre, in Charing Cross Road, London, W.C., was first opened by Sir John Hard in April 1889 with Pinero's *The Profligate*. It must be distinguished from the G. T. opened in Whitechapel in 1830, which was rebuilt in 1845 and used for *opéra bouffe* as late as 1879. Some of the more important plays produced at the present theatre were Grundy's *A Pair of Spectacles* (1890); Pinero's *Lady Bountiful* and Robertson's *School* (1891); and Grundy's *A Fool's Paradise* (1892). Pinero's *The Notorious Mrs. Eddsmith* was produced in 1893, in which year Mme Réjane appeared here in *Mme Sans-Gêne* and *Ma Cousine*. Later successful plays were Hope's *Pinkerton's Peerage* (1902); *Where the Rainbow Ends* (1911); *Cyrano de Bergerac*, with Robert Loraine in the name part (1919); Eden Phillpotts' *The Runaways* (1928); *The Lady with a Lamp* (Jan. 1929); *The Stranger Within* (June 1929); *Happy Families* (Oct. 1929); and *My Wife's Family* (1931).

Garrison, William Lloyd (1804-79), Amer. philanthropist, leader of the abolitionists in the anti-slavery struggle. In 1826 he became editor of the Newburyport *Free Press*. He ed. the *National Philanthropist*, 1827, and pub. at Boston the celebrated *Liberator*, a jour. urging the abolition of slavery in the S. from 1831 to 1865. He was much influenced by Lundy, and joined him at Baltimore, 1829, in editing the *Genius of Universal Emancipation*. His vigorous denunciation of slavery involved him in a charge of libel, and brought about his imprisonment at Boston in 1831. In 1832 he founded the New England Anti-Slavery Society, the first of many similar organisations. The Amer. Anti-Slavery Society was formed in 1833 in Philadelphia. Of this G. was president 1843-65. His extreme views made him many enemies, and his life was often threatened, but he lived to see his hopes in great part realised. He pub. *Thoughts on African Colonisation*

(1832) and *Sonnets and Other Poems* (1843). *The Words of Garrison* appeared in 1905. See ABOLITIONISTS. See W. P. Garrison, *Life of W. L. Garrison*, 1892; F. E. Cooke, *An American Hero: the Story of W. L. Garrison*, 1910; and J. J. Chapman, *Garrison*, 1913.

Garrod, Heathcote William (b. 1878), Eng. scholar and writer. As an undergraduate at Oxford Univ. he gained the Hertford scholarship in 1899 for Lat., and in the same year the Craven scholarship for classical learning. He also won the Gaisford prize for Gk. prose (1900) and the Newdigate prize for Eng. verse (1901). He graduated at Merton College, and in 1902 went to Corpus Christi College as tutor, returning to Merton to become tutor there in 1904. During the First World War he worked first in the Ministry of Munitions, and then in 1918 in the Ministry of Reconstruction. He was awarded the C.B.E. in that year. In 1923 he was appointed to the chair of poetry at Oxford, which he held until 1928. In 1929 he went to the U.S.A., where he was Charles Eliot Norton prof. of poetry at Harvard Univ., returning the following year to Merton, where he has held a fellowship since 1901. His lectures delivered at Harvard were pub. in 1931, with the title *Poetry and the Criticism of Life*. He has ed. a number of Lat. texts, including Statius, Manilius, and Horace, and also ed. the Oxford ed. of Keats's poetical works (1938). In addition to eds. of other Eng. authors his writings include *The Profession of Poetry and other Lectures* (1929); *Poetry and Life* (1930); *The Study of Poetry* (1936); *Scholarship: its Meaning and Value* (1946); and also monographs on Byron (1923) and Keats (1926).

Garron, see HORSE, Ponies.

Garrotte (Sp. for cudgel) is an appliance which is used in Spain for the execution of criminals. The condemned man is seated on a scaffold fastened to an upright post by an iron collar (the G.) and a knob worked by a lever dislocates his spinal column. Garrotting is the name given in England to a form of robbery which became rather common in 1862-63. The Act of 1863, which imposed flogg'ng for this offence, is generally accepted as having put a stop to it, though humanitarians contend that the outbreak of garrotting was already coming to an end. See H. S. Salt, *The Fallacy of Flogging*, 1916.

Garstang, John (b. 1876), Brit. archaeologist. Educated at Blackburn Grammar School and Oxford Univ. Has been engaged in archaeological research since 1897, notably on Rom. sites in Britain, in Egypt, Nubia, and Asia Minor. After the First World War he was appointed director of the Palestine Govt.'s dept. of antiquities, which he was instrumental in founding in 1920. From 1927 he has devoted himself to archaeology as Rankin prof. at Liverpool Univ. Was leader of the Marston archaeological expedition to Jericho, and his discoveries there (1930-1931) have afforded the strongest evidence of the authenticity of O.T. narratives

(*see also JERICHO*). King's silver jubilee medal, 1935. Head of the archaeological dept. in Turkey, 1917. Pubs.: *Roman Ribchester* (1890); *The Third Egyptian Dynasty* (1904); *A Short History of Ancient Egypt* (in collaboration with Prof. Percy Edward Newberry) (1904); *The Land of the Hittites* (1910); *The Foundations of Bible History: Joshua, Judges* (1931); *The Heritage of Solomon* (1934); reports on the excavation of Abvdos, Meroë, Jericho, and at Mersin in *Liverpool Annals of Archaeology* (1932-39); and has ed. bulletins of the Brit. School of Archaeology in Jerusalem.

Garstin, Sir William Edmund (1849-1925), Brit. civil engineer, b. in India, son of a civil servant there. Educated at Cheltenham and King's College, London. Returning E., he served for twelve years in the Indian public works dept. From 1892 to 1904 he was inspector-general of irrigation in Egypt, being also under-secretary for public works. He explored the Nile from source to delta, a 7000-m. journey, much of it through terrible malaria-ridden country, and presented a brilliant report. His investigations convinced him that, with so vast a loss of Nile water through enormous swamps and evaporation, the water of the lower riv. should be stored in great quantities during the ann. flood, and distributed through irrigation canals when the riv. reached its lower levels. The work of control of the flow of the riv. was carried out mainly under G.'s administration and in accordance with his plans. It comprised the construction of the Aswān dam and the barrages at Asyūt and Esna, which were all parts of one system of water storage and control. The subsequent heightening of the dam and the construction of the Esna barrage were not completed before he retired. The Asyūt barrage was constructed, according to G.'s directions, from the original design of (Sir) Wm. Willcocks (1898-1902). In addition G. caused the clearing of the White Nile of its floating forests of rotting vegetation (sudd) which made navigation difficult or impossible. Lord Cromer says that it would be difficult to exaggerate the debt of gratitude which the people of Egypt owed to G. (*see Modern Egypt*, vol. I, p. 636); and on another occasion he described G. as 'the greatest hydraulic engineer in this or any other country.' The Egyptian Nationalist press styled G. 'the treasure of Egypt.' Knighted, 1897, and in 1904 he was appointed a director of the Suez Canal Company.

Garston, seaport on the Mersey about 6 m. S. of Liverpool. It has a quay about a mile long fitted with special machinery for the shipping of coal, which is the chief article of export. Pop. 24,000.

Garter King-of-Arms, one of the officers of the order of the Garter, the others being the prelate, chancellor, registrar, and gentleman usher of the black rod. *See HERALDRY.*

Garter, Order of the, was instituted by Edward III. about 1348. The colour of the emblem chosen was blue, and the motto *Honi soit qui mal y pense*. St.

George was its special patron, and it has been called the order of St. George. Originally there were to be twenty-five knights-companion, excluding the king, who were to assemble every year on the eve of St. George's Day in St. George's Chapel. Later distinguished foreigners were admitted into the order. The ensigns of the order at first consisted of garter, surcoat, mantle, and hood, later the collar and George, the star and the under-habit were added. The order has for its emblem the *garter*, which is made of dark blue velvet about an inch wide, with the motto in gold letters, and is worn on the left leg a little below the knee. The mantle now worn is of purple velvet lined with white silk, having on the left shoulder the *badge* of the order, a silver escutcheon charged with a red cross for the arms of St. George and encircled with the garter and motto. The surcoat and hood, which is now worn on the right shoulder, are made of crimson velvet. A cap, ornamented with ostrich feathers and a tuft of black heron's feathers fastened by a clasp of diamonds, is now worn instead of the hood. White silk stockings and white shoes with red heels completed the costume. The *collar*, introduced by Henry VII., consists of knots of cords alternated with red and white roses, and a figure of St. George piercing the dragon hanging from one of the roses. The *star* introduced by Charles I. is a badge with the cross of St. George encircled by the garter, the whole being surrounded by rays of silver. The under-habit was introduced by Charles II. Each knight has his stall in St. George's Chapel, Windsor, and the garter plates of the knight remain permanently. Those placed there in the reign of Henry VII. are valuable heraldic relics. The order still ranks first among the orders of knighthood of Europe. Knights of the Garter write K.G. after their names.

Garth, Sir Samuel (1661-1719), Eng. physician and poet, b. at Bowland Forest, Yorkshire; studied at Peterhouse, Cambridge Univ., and took his medical degree at Leyden in 1691. He came to London and was elected a fellow of the College of Physicians, 1693. In 1697 he delivered the Harveian oration at the College of Physicians, half of which is a panegyric of William III. He was a zealous Whig, the friend of Addison, of the second Christopher Codrington (1668-1710), the famous Governor-general of the Leeward Is., of John Boyle, earl of Orrery, and, though of different political opinions, of Pope. Became physician in ordinary to George I., who knighted him (1714), and he soon acquired a large practice. He is, however, chiefly remembered as the author of *The Dispensary* (1699), a satire in the heroic couplet, which went through three eds. in a few months and was generally read for half a century. It ridicules the apothecaries by describing a mock-heroic battle between them and the physicians, and at the end of the poem G. mentions a scheme which had been mooted in the College of Physicians twelve years previously

for setting up a dispensary where the poor might obtain advice and prescriptions from the best physicians. For this poem G. probably borrowed from Dryden's *MacFlecknoe* and Bolleau's *Lutrin*. It was much admired by Christopher Codrington, who wrote some commendatory verses for the third ed. which pour scorn on the critics, particularly on the 'city bard.' Sir Richard Blackmore (c. 1650-1729). Codrington's private copy of this third ed. is now in the library of the College of Physicians. Also wrote *Claremont* (1715), a poem on Lord Clare's villa; an Eng. verse trans. of Ovid's *Metamorphoses* (1717), to which Addison, Pope, and others contributed; a dedication in verse of Ovid's *Ars Amatoria* to the earl of Burlington; and a number of fulsome lampoons. It was through his intervention that an honourable burial was given to Dryden, over whose remains he pronounced a eulogy. See Samuel Johnson, *The Lives of the Poets*, vol. II., 1781, 1905 (ed. by G. Birkbeck Hill); T. Schenk, *Sir Samuel Garth und seine Stellung zum Komischen Epos*, 1900; and R. P. Bond, *English Burlesque Poetry, 1700-1750*, 1932.

Gartokh, or Cartok, tn. in Great Tibet in the Nari-Khorsun prov. It stands at a height of 14,210 ft above the sea in one of the loftiest mt regions in the world. To the E. of the tn. are salt-mines, and the important gold-mining dist. of Thok-Jalung lies 85 m. to the N.E. An active trade is carried on in shawl wool, tea, etc. In accordance with the Tibet Treaty of 1904 it was thrown open to Brit. trade. In winter (it consists of only a few dozen people, but in summer trade passing through makes it a busy place.

Garvis, Alfred Ernest (1861-1945), religious author; b. at Zyrardow, Russian Poland, and educated privately and at George Watson's College, Edinburgh. He took his M.A. at Oxford in 1888, minister of Macduff Congregational church, 1893-95, and from 1895 to 1903 of Montrose Congregational church. Prof. of philosophy of theism, comparative religion, and Christian ethics in Hackney and New Colleges, London, 1903-7. Principal of New College, Hambstead, from 1907. His pub. include *The Ethics of Temperance* (1895); *The Ritschlian Theology* (1899); *The Gospel for To-day* (1904); *My Brother's Keeper* (1905); *The Christian Certainty* (1910); *The Christian Belief in God* (1933); *Revelation through History and Experience* (1931); *The Christian Faith* (1930); *Memories and Meanings of My Life* (1937); and *Christian Moral Conduct* (1938).

Garvin, James Louis (1868-1947), Brit. journalist and biographer, b. at Birkenhead, Cheshire, of Irish stock. His father was drowned at sea and his mother left in poverty. When his mother's circumstances improved, she provided him with a course in science and languages with a view to a civil service career. G. read omnivorously and was endowed with a Macaulay-like memory, and he acquired a wide knowledge of Eng. and European literature. He began work in the corn

trade as a bookkeeper and foreign correspondence clerk. His business training later served him in good stead. G. began journalism on the *Newcastle Chronicle*, was its leader writer and literary critic 1891-99. From the age of twenty-six he contributed to the *Fortnightly Review*, and for many years from 1900 wrote articles on foreign affairs, often under the pen-name 'Calchas.' Also contributed to the *National* and the *Quarterly*. Then joined the staff of the *Daily Telegraph* as leader writer, also doing descriptive reporting. In the N. he had been known as an Irish Nationalist, a fervent admirer of C. S. Parnell. Subjected by his new Conservative surroundings, he came into prominence as chief journalistic backer of Joseph Chamberlain's tariff reform policy in 1903. Left it to edit the *Outlook*. On a change of ownership of that paper he returned to the *Daily Telegraph*. His next move brought him in touch with Lord Northcliffe and the *Observer*, which the latter had (1905) bought for £5000 and who now consulted G. on running it as a paying proposition. G. became editor with a share in the paper. Later Northcliffe wanted either to buy out G. or that G. should buy him out; but when Lord Astor bought the paper, G. was estab. in the editorial chair and his long career on the paper only ended in 1942. Throughout the thirty-five years of his editorship, his influence, at times great and never negligible, extended far beyond his own country; and by his own profession he was acknowledged as one of its leaders, and by readers everywhere as a political writer and biographer of the front rank. In 1910, for a brief while, he returned to his faith in Irish nationalism, but on the breakdown of the conference he called on the country to 'break with the dollar dictator' (i.e. John Redmond). He was editor of the *Pall Mall Gazette* 1912-15. An adverse critic of the treaty of Versailles. Editor-in-chief of the *Eency. Brit.* 1926-29. Pub. *The Economics of Empire* (1905); *Imperial Reciprocity* (1903); *Tariff or Budget* (1909); and *The Economic Foundations of Peace* (1919). His *Life of Joseph Chamberlain*, planned in four large vols., three of which were pub., was an achievement comparable to John Morley's *Life of Gladstone*, and it goes far to clear up his subject of many of the calumnies and myths which had obscured his memory. But perhaps it is chiefly as the greatest of Brit. 'columnists' that he will be remembered, especially for his cogent style which seems to owe something to Carlyle, and which had an element of the showman in it—an element which, however, was well calculated to attract attention to what he had to say. When in 1912 his connection with the *Observer* came to an end he accepted Lord Beaverbrook's offer to contribute to the *Sunday Express*, but after a year returned once more to the *Daily Telegraph*. C.H. in 1941; honorary doctorates of Edinburgh and Durham Univs. were conferred on him. See Katharine Garvin, *J. L. Garvin*, 1948.

Gas and Gases. The word gas was invented by J. B. van Helmont (c. 1640) to describe the G. now known as carbon dioxide. It was formerly supposed that the word was derived from the Dutch *geest* (Ger. *Geist*), spirit, but that this is an incorrect view is shown by van Helmont's words: 'I have called this spirit *gas*, as it is not distinguishable from the Chaos of the ancients.' The term is now used to describe one of the three states of aggregation of matter. In simple language these three states of aggregation may be defined thus: 'A solid has volume and shape; a liquid has volume, but no shape; a gas has neither volume nor shape' (Sir O. Lodge). 'Vapour' is the term applied to a G., which by comparatively small changes of temp. or pressure may be liquefied. The first G. to be studied in detail was atmospheric air. It was possibly suspected in the seventeenth century by Rey and Mayow that the increases in weight which a metal undergoes during burning in air is due to a combination of the metal with some constituent of the atmosphere. The recognition of this important fact and its full significance was greatly retarded by the influence exerted by the phlogistic school (see *phlogistic theory* under *History in CHEMISTRY*). The discovery of oxygen by Priestley and Scheele, and of nitrogen by Cavendish, failed conclusively to determine what happened during combustion, until these facts were interpreted by Lavoisier, who gave the first satisfactory explanation of the phenomena of combustion, and thereby estab. the principle now known universally as the conservation of mass. The early workers on the nature of Gs. (or 'airs' as they were then called) were Cavendish, Black, Scheele, and Priestley, and to their credit must be set the discovery of oxygen, hydrogen, nitrogen, carbon dioxide, oxides of nitrogen, etc., and the investigation of their properties. Towards the end of the nineteenth century sev. 'rare' Gs. (q.v.) were identified and isolated by Ramsay, Rayleigh, Travers, and other workers. These Gs. are argon (now used in G.-filled lamps), krypton, xenon, neon (familiar in advertising signs), and helium (found first in the sun and subsequently in the atmosphere and on the earth near radioactive springs). The properties of Gs. have been studied extensively, and the fruits of these investigations are (a) the atomic theory of matter, (b) the kinetic theory of matter, and (c) the electrical theory of matter. Dalton, Gay-Lussac, and Avogadro are associated with the important discoveries that led to the first theory; Bernoulli, Maxwell, and Clausius with the second theory; while J. J. Thomson and Rutherford are two of the most famous scientists associated with the discoveries that estab. the third theory. There are four fundamental rules or laws governing the behaviour of Gs., viz.:

1. **Gay-Lussac's Law.**—The volumes of reacting Gs. bear a simple relation to each other and to the volume of the resulting product.

2. **Boyle's Law.**—The volume of a given

mass of G. varies inversely as its pressure, provided that its temp. remains constant. Mathematically this is stated as follows: $PV = \text{a constant}$, where P is the pressure and V is the volume of the given mass of G. at the given temp.

3. **Charles's Law.**—The volume of a given mass of G. increases by $\frac{1}{273}$ of its volume at 0°C . for a rise of 1°C , when the pressure of the G. is kept constant.

4. **Avogadro's Law.**—Equal volumes of all Gs. measured under the same conditions of temp. and pressure contain equal numbers of molecules.

The above laws apply to 'perfect' Gs. (see below) only. They are approximately obeyed at ordinary temps. and pressures by the so-called 'permanent' Gs., e.g. oxygen, air, hydrogen, helium, etc., that are only liquefied at temps. far below 0°C .

Kinetic Theory of Gases (q.v.).—The striking successes of this theory are (1) the explanation of the pressure, volume, and temp. relations of a G. mentioned above, (2) the determination of the sizes, speeds, and 'free paths' of the molecules of Gs., (3) the explanation of the phenomena of viscosity, diffusion, and conduction of heat in Gs., (4) the explanation of the specific heats of Gs., and (5) the interpretation of the laws of thermodynamics (q.v.). The mathematical calculations underlying this theory begin by postulating a *perfect gas*, viz. a G. whose molecules are assimilated to perfectly elastic particles of negligible dimensions that exert no force of attraction on each other. These molecules are in constant motion, and their velocities are only changed when they collide with each other. The molecules travel in straight lines between collisions. Subsequently the properties and behaviour of real Gs. are explained, and the following data give an idea of some of the results of this theory: (1) *diameter of molecules*: hydrogen 2.4×10^{-8} cm.; oxygen 3.0×10^{-8} cm.; nitrogen 3.2×10^{-8} cm.; helium 1.9×10^{-8} cm.; (2) *average velocity* at 0°C . of molecules: hydrogen 162,800 cm. per sec.; oxygen 42,000 cm. per sec.; nitrogen 45,400 cm. per sec.; helium 120,400 cm. per sec.; (3) at 0°C . and 760 mm. of mercury pressure, the number of molecules in 1 c.c. of a G. is 2.9×10^{19} . Some idea of the state of affairs in a G. may be gathered from the fact that a molecule suffers something like 8,000,000,000 collisions per second at normal temp. and pressure. The walls of the containing vessel are bombarded by the molecules of the G. and this bombardment accounts for the phenomenon of the pressure exerted by a G. At the absolute zero of temp. (see below) the molecules of every substance are at rest relative to each other.

Densities and Molecular Weights of Gases.—Since equal volumes of Gs. under the same conditions contain equal numbers of molecules, the densities are in the same ratio as the molecular weights. This principle of Avogadro furnishes a method of determining molecular weights of substances in the gaseous condition. If hydrogen be taken as the unit in determining densities, then since the molecular

weight of hydrogen is 2, the molecular weights of Gs. are twice the respective densities. In order to determine the density of a G. two methods are available: (1) by weighing a known volume of the G., (2) by measuring the volume of a known mass of G. The former method is the most usual, and is carried out by weighing a globe or vessel (whose volume is previously determined by weighing it full of water) full of the G. at a known pressure, and then reweighing it after it has been exhausted by means of a molecular pump. When the density of one G. has been determined, that of any other can be found by comparing its density with that of the first G. This comparison can be made very accurately by means of the micro-balance. The micro-balance consists essentially of a light balance beam delicately pivoted inside a glass vessel that has two outlet tubes attached to it and a manometer for measuring the pressure of the enclosed G. The beam itself has a solid piece of quartz fixed on one end and a larger hollow quartz ball on the other end, so that when the vessel is filled with a G., the upward thrust of the G. will be greater on the hollow ball than on the solid piece of quartz (Principle of Archimedes). The denser the G. the greater the difference between the upward thrusts on the two halves of the beam. The first G. is introduced, and the pressure p_1 required for equilibrium of the beam is recorded by the manometer. The vessel is then exhausted and filled with the second G., and the pressure of the latter is adjusted to p_1 . In order again to restore equilibrium of the beam. Hence at pressure p_1 , the second G. must have the same density as the first G. has a pressure p_1 . Now Boyle's law tells us that if the temp. remains constant the pressure of a G. varies directly as its density. Hence the density of the second G. at pressure p_1 will be $d_2 = \frac{p_1}{p_2} d_1$, where d_1 is the known density of the first G. at pressure p_1 .

In order to determine the density of a vapour, Victor Meyer's method is used. It consists essentially in volatilising a small known mass of the substance, and collecting and measuring its volume by the volume of air it displaces from the apparatus. Vapour densities are of importance in determining the molecular complexity of substances. Hydrogen, chlorine, and nitrogen, for example, are shown to be diatomic, i.e. to contain two atoms in the molecule. Zinc, cadmium, and mercury, on the other hand, are monatomic. It is interesting to notice that in many cases the number of atoms in the molecule varies with the temp. In the case of sulphur, for example, the vapour density at 500° C. shows that there are six atoms in the molecule, whilst at 1100° C. there are only two atoms in the molecule.

Specific Heats of Gases (see SPECIFIC HEAT).—The first law of thermodynamics (q.v.) tells us that work (q.v.) may be performed at the expense of heat energy, and that the amount of work so performed is equivalent to the amount of

heat energy supplied to do this work. When a G. is heated it may expand and do work; in this case only part of the heat supplied will be available for raising the temp. of the G. As the G. may be allowed to expand in an infinite variety of ways, it follows that when a given amount of heat is supplied to a given mass of a G. its rise of temp. may be one of an infinite variety of degrees. In other words, a G. has an infinite number of specific heats. Two of these are of considerable importance, viz. the specific heat of a G. at constant volume and the specific heat of a G. at constant pressure. For hydrogen $C_p = 3.41$; $C_v = 2.40$, where C_p and C_v are respectively the specific heats of a G. at constant pressure and constant volume. For monoatomic Gs. the kinetic theory of Gs. deduces that $C_p/C_v = \frac{5}{3}$; for diatomic Gs. $C_p/C_v = \frac{7}{5}$; for triatomic Gs. $C_p/C_v = \frac{9}{7}$. Although these theoretical deductions are made for perfect Gs., the success of the theory may be gauged from the following typical results for this ratio for Gs. that approximate to a perfect G. under ordinary conditions: argon (monoatomic) 1.867; hydrogen (diatomic) 1.407; nitrous oxide (triatomic) 1.324.

Diffusion of Gases (see DIFFUSION).—Diffusion takes place more readily in Gs. than in solids or liquids, by reason of the greater velocities of the molecules in the gaseous state, and because the force of attraction between the molecules of a G. is exceedingly small. Graham's researches on the diffusion of Gs. led to the conclusion that the rate of diffusion is inversely proportional to the square-root of the density of the G. Hydrogen, being the lightest G., will diffuse most quickly, but when any Gs. are mixed together diffusion results in a uniform mixture of the Gs. In this way the noxious Gs. produced in industrial centres are rapidly distributed and the composition of the air is thereby maintained almost constant.

Liquefaction of Gases.—When a G. contained in a vessel is subjected to a continually increasing pressure, the volume may continually decrease, the contents remaining homogeneous, or a separation into G. and liquid may result. The deciding factor is the temp. It has been found that for every G. there is a temp., known as the critical temp., above which it is impossible to liquefy the G. however much it is compressed. The behaviour of Gs. during compression is well illustrated by the case of carbon dioxide, which was studied exhaustively by Andrews. In the accompanying diagram the abscissæ represent volumes and the ordinates pressures. The curves are known as *isothermals* (q.v.), and represent the changes that take place when carbon dioxide is compressed at constant temp. Reference to the diagram shows that when the G. was compressed at a temp. of 13.1° C., separation of liquid carbon dioxide began at a pressure of 48.9 atmospheres. Condensation continued without further increase of pressure until liquefaction is complete, after which the volume of the liquid decreases only slightly for a large increase of pressure.

Similar results were observed at 21.5° C., but when the compression took place at a temp. of 31.1° C., no abrupt changes of volume were noticed and there was no separation of liquid. Similarly at higher temps. no liquefaction takes place; indeed Andrews found that it was impossible to liquefy carbon dioxide at any temp. above 30.9° C., which is therefore known as the critical temp. for this G. The pressure required to cause liquefaction at this temp. is called the *critical pressure*. Although the problem of the liquefaction of Gs. received early attention and the possibility of the liquefaction of air was vaguely hinted at by Lavoisier, the cause of the 'resistance' offered by the so-called permanent Gs. was not understood until the above critical phenomena had been explained. The early experimenters included Mouge and Clouet, who liquefied sulphur dioxide, Davy and Faraday, who liquefied chlorine, and Bussy, who in 1821 showed that when liquid sulphur dioxide was allowed to evaporate a much lower temp. was obtained. This observation has been of prime importance in later work on the liquefaction of Gs., for it has enabled experimenters to cool the 'recalcitrant' Gs. below their critical temps. when liquefaction can be obtained by compressing the Gs. sufficiently. Calletet in 1877 liquefied oxygen and carbon monoxide by subjecting the G. to a pressure of 300 atmospheres, cooling it by evaporating sulphur dioxide, and then suddenly releasing the pressure. Pictet also succeeded in liquefying oxygen, and thought he obtained evidence of having prepared liquid hydrogen. Wroblewski and Olzewski in 1883 liquefied oxygen, previously cooled by liquid ethylene at -130° C., and then liquefied by hydrogen previously cooled by liquid oxygen. Many of the so-called permanent Gs. were also solidified. More recent work is that of Linde, Hampson, Dewar, and Kammerlingh Onnes. The same principle was adopted by each worker, viz. the G. is compressed and then cooled. After cooling it is allowed to expand by passing through a porous plug (Joule-Thomson effect), whereby the temp. is further reduced. The cold G. is used to cool more of the compressed G., and the process of cooling continues at 'compound interest,' until finally liquid is formed. The last G. to be liquefied was helium (Kammerlingh Onnes, 1908). It is interesting to note that this G. and other rare Gs. were isolated by the fractional distillation of liquid air. The following are the boiling-points of some of the so-called permanent Gs. under a pressure of 760 mm. of mercury: hydrogen -232.7° C., oxygen -183.0° C., nitrogen -195.8° C., argon -185.7° C., helium -268.0° C. Liquid Gs. are stored in *Dewar glasses* ('vacuum flasks'), which are double-walled, the space between the walls being evacuated in order to minimise conduction and convection of heat to the liquid, and the inner surfaces of the walls are silvered in order to prevent radiation to and from the liquid G.

Van der Waals's Equation.—The 'characteristic' equation for a perfect G.,

obtained by combining the laws of Boyle and Charles, is $PV = RT$; P = pressure, V = volume, R = a constant, and T = absolute temp. of the G. The value of R depends on the mass of G. under consideration; for a mass of G. equal to the molecular weight in grams it has the value 8.3×10^7 , where the volume of the G. is measured in c.c., and its pressure in degrees per sq. cm. T is measured from the absolute zero of temp., viz. -273° C., the lowest possible temp., since the molecular velocities of all substances would vanish at that temp. Real Gs.—even the so-called permanent Gs.—only obey this equation approximately at ordinary temps. and pressures, whilst at temps. not far above their critical temps., or at high pressures, the deviations from the behaviour of a perfect G. are serious. This is due to two causes: (1) The molecules of a real G. are of finite size, (2) the attraction exerted by the molecules on each other is not zero. The importance of these two factors is relatively small when the pressure of the G. is small and the temp. is considerably above its critical temp., for then the volume occupied by the incompressible material (the molecules themselves) is very small compared with the volume occupied by the G., and the distance between the molecules is relatively great. A vapour is defined as a G. at a temp. not far removed from its critical temp., and its properties differ considerably from those of the perfect G. Van der Waals's equation is an attempt to obtain a characteristic equation for a real G.—an equation that will be true for all temps. and pressures, so that it does not differentiate between a G., a vapour, and a liquid, but attempts to account for the *observed* differences in their properties.

This equation is $(P + \frac{a}{V^2})(V - b) = RT$. a and b are constants for the G. We can compare this equation with that of the perfect G., viz. $PV = RT$, and interpret the term $\frac{a}{V^2}$ as representing the effect on the pressure of the molecular attraction resisting the expansion of the G. The constant b cannot differ considerably from the liquid volume; it is in fact equal to four times the total volume of the molecules. These terms are relatively unimportant at ordinary temps. and pressures for Gs. like air, hydrogen, etc., and hence these Gs. approximate to perfect Gs. under such conditions. Qualitatively van der Waals's equation has been successful in accounting for the deviations from the perfect G. laws, and for the existence of a critical temp. Its quantitative success is fairly good for carbon dioxide, but its success for other Gs. is not striking. Following van der Waals many attempts have been made to obtain a characteristic equation for a fluid, and of these the equations proposed by Clausius, Chapman, Dieriot, and Lees are the most noteworthy.

See T. Preston, *Theory of Heat*, 1894; E. Bloch, *Théorie cinétique des gaz*, 1921; G. Birtwistle, *Thermodynamics*, 1925; J. R.

Partington, General and Inorganic Chemistry, 1946; and Sir J. Townsend, Electricity in Gascoyne, 1948.

Gas Authority, British. The authority set up under the Gas Bill, which was passed on July 30, 1948, to provide for the organisation of the entire Brit. gas industry under public ownership and thereby complete the gov.'s plans for the nationalisation of fuel and power. From the appointed day (May 1, 1949) the functions of gas undertakings were transferred to twelve area gas boards and all gas companies were to be dissolved as from the vesting date. The boards were set up to develop and maintain an 'efficient, co-ordinated, and economical system' for the supply of gas in their areas and the manufacture and disposal of coke.' The boards also have power to manuf. and sell other products of carbonisation and to carry on any other activities 'which appear to be requisite, advantageous, or convenient, to the discharge of their duties' or in order to make the best use of their assets. The boards have sole responsibility for fixing tariffs for the manuf. and distribution of gas and other products—subject to general directions by the minister of fuel and power. But in matters affecting capital development, research, training, and education must act in accordance with a general programme approved by the minister. The Act also provides for the setting up of a Central Gas Council to advise the minister, assist the boards to discharge their functions, and, when authorised by them, act on their behalf in matters of common interest. On the whole the council is more of an advisory body than is the Brit. Electricity Authority, the Gas Act providing for a greater measure of decentralisation. The council consists of a chairman and deputy chairman appointed from persons having experience of gas supply, industrial, commercial, and financial matters or the organisation of workers, and the chairmen of the twelve area boards. The chairman and vice-chairman of the council receive salaries of £6000 and £5000 respectively; the chairmen of the area boards £4500 plus an expenses allowance up to £500. Under the Act the G. A. took over more than 1000 statutory and non-statutory undertakings, including those of local authorities (which latter accounted for about one third of the nation's gas supply). The total compensation payable to gas companies was estimated at about £200,000,000, whilst local authorities were compensated on the basis of the net outstanding debts of their gas undertakings, these being estimated at £25,000,000. In addition £2,000,000 was made available for division between all local authorities affected as compensation for severance (i.e. estab. charges and overheads). Holders of gas securities receive compensation, not on stock exchange values, but on the income which could reasonably have been expected if the industry had not been nationalised, multiplied by a number of years' purchase agreed between the stockholders and the minister of fuel and power. Gas com-

pensation stock is a 3 per cent stock, dated 1900-95, issued at par and redeemable at par.

Gas, Coal, see GAS MANUFACTURE.

Gascoigne, George (c. 1525-77). Elizabethan poet and dramatist, the son of Sir John G. He was educated first at Canterbury and then went to Cambridge. On his return to London he became a student at Gray's Inn. He led a wild and reckless life, and was disinherited in consequence by his father. He then joined Sir Humphrey Gilbert and took service under the prince of Orange against the Spaniards. On his return he accompanied Queen Elizabeth on one of her royal progresses, and to celebrate the event wrote a masque entitled *The Princeley Pleasures, at the Courte at Keneworth* (1576)—his well-known satire in blank verse, *The Steele Glas*, appeared in the same year. This satire on the vices and foibles of the age shows monarchs, soldiers, prelates, merchants, and peasants as they really are, without flattery or idealisation, as in the crystal glass 'wherin all men choose to look.' He is also the author of the *Supposes* (1573), a trans. of the *Suppositi* of Ariosto and the earliest extant comedy in Eng. prose; *Jocasta* (1573), a version of the *Phœnissæ* of Euripides, the second earliest tragedy in blank verse; *The Glasse of Governement* (1575), and *Complaynt of Phylomene* (1587). Mention may also be made of his prose romance, *The Pleasant Fable of Ferdinand Jeronimi* (1587), which, in its sentimental colloquies and alliterative style, is a forerunner of *Euphues; Dan Bartholomew of Bath* (1573), a kind of novella in verse on the hero's passion for an inconsistent beauty, and the *Fruit of Feltis*, in which Bartholomew reappears as the Green Knight—both bovine disguises of G. himself, and of *Certain Notes of Instruction concerning the Making of First or Rhyme in English* (1575), said to be the first attempt at a treatise on prosody in the language. He is, however, much more entertaining in undigested verse narrative of his own experiences, as in the *Voyage into Holland* (1573), and *Dulce Bellum Inexpedit* (1575) the last named giving a vivid picture of his experiences in Flanders. His works were ed. by W. C. Hazlitt (1869-70) and J. W. Cunliffe (1907-10). See G. Whitstone, *A Remembrance of the well employed life and godly end of George Gascoigne, Esquire, 1577* (ed. by E. Arber, with *The Steele Glas*, 1866); and F. E. Schelling, *The Life and Writings of George Gascoigne*, 1893.

Gascoigne, Sir William (c. 1350-1419). Eng. lawyer; eldest son of Wm. G., b. in Yorkshire. In 1397 he became one of the king's serjeants and was appointed attorney to the banished duke of Hereford. He was made chief justice of the king's bench in 1400, and in 1403 was commissioned to raise forces against the insurgent earl of Northumberland. The stories told about him, that he committed Prince Henry for contempt of court and that he refused to judge Archbishop Scrope on the ground that he had no

jurisdiction over spiritual persons, prove that he was regarded as a just judge, possessed with a high sense of the dignity of his office and indifferent, in the pursuit of his duty, to his personal interest.

Gascony (Fr. *Gascoigne*), old prov. in the S.W. of France. It derived its name from the Vasques, or Vascons, a Sp. tribe which crossed the Pyrenees about 580. It now forms the depts. Landes, Gers, Hautes-Pyrénées, and part of Basses-Pyrénées. Formerly it was a dependency of Gulegne, and its cap. was Auch. Part of it belonged to the sovereigns of Navarre, and it was united to France in 1598.

Gas Cookers. Among the earliest attempts to use gas for cooking were those of J. Sharp about 1835, when he constructed ovens heated by gas for baking. In one that he constructed for a Leamington hotel a dinner was prepared for a hundred persons.

The modern gas cooker is a very efficient and well-designed appliance, consisting of an oven and a hot-plate, with boiling and simmering burners and a grill. The hot-plate can be placed either above the oven or alongside it. Cookers can be free-standing or built into cupboard fittings. Thermostatic control of the oven gives precise reproducible cooking conditions and eases the cook's tasks. A low-temp. cabinet for keeping food and plates warm or for long-period slow cooking can be an integral part of the cooker or fitted independently of it. G. C. are finished in easily cleaned enamel with safety tops of chromium or plastic material, and ovens are well insulated to prevent heat loss. From 8,000,000 to 9,000,000 homes in Great Britain use gas for cooking.

Gascoyne-Cecil, James Edward Hubert, and Robert Arthur, see SALISBURY, MARQUEES OF.

Gas Engines are internal combustion engines (q.v.) using a gaseous fuel. The

in submarine engines. The first practically important gas engine was made by Lenoir in 1860. In construction this resembled an ordinary single-cylinder horizontal steam engine. Slide valves worked by eccentrics controlled the admission of air and gas and the escape of the combustion products to the air. As the piston moved forward it drew in an explosive mixture of air and gas, and at mid-stroke the inlet valve closed and the mixture was ignited by an electric spark. During the remainder of the stroke, work was done because of the rapid rise of pressure of the hot products, and simultaneously the products of a previous explosion on the other side of the piston were expelled. In the course of the backstroke the products formed by the explosion described were expelled, and a fresh explosive mixture drawn in on the other side, and so on. An indicator diagram from Lenoir's engine is shown in Fig. 1. The action takes place in the direction shown by the arrows.

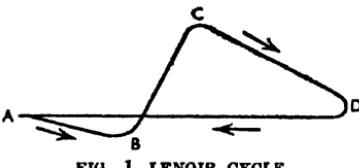


FIG. 1. LENOIR CYCLE

The curve AB represents the gas and air being drawn in at an almost uniform pressure. Then there is a rapid rise of pressure as the mixture explodes, shown by BC; after which, while the products continue to expand, the pressure gradually diminishes, as shown by the curve CD. Finally the backstroke expels the pro-

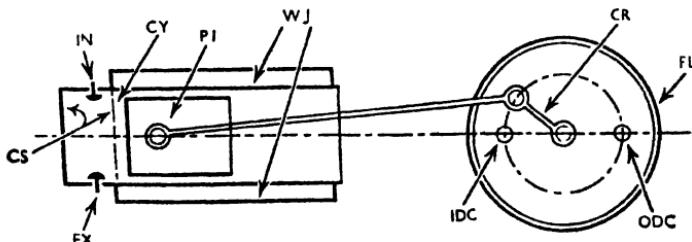


FIG. 2. DIAGRAM OF OTTO ENGINE

IN, inlet; CY, cylinder; PI, piston; WJ, water jacket; CR, crank; FL, flywheel; CS, combustion or clearance space; EX, exhaust; IDC, inner dead centre; ODC, outer dead centre.

first real gas engine was built in 1820 by Wm. Cecil of Cambridge, who used the explosion of a mixture of hydrogen and air in the cylinder to drive the piston. This engine did not achieve commercial importance, but it is interesting to note that during 1939-45 the Gers. used hydrogen peroxide as working substance

ducts at atmospheric pressure as represented by the horizontal line DA. On account of its excessive consumption of gas—nearly 100 cu. ft. per h.p. per hour (about five times the quantity used in a modern gas engine), due to the small expansion of the explosive mixture, and the low pressure on the piston—the engine was

soon superseded, though a number of Lenoir engines were actually in use for many years.

In 1866 N. A. Otto and E. Langen built a vertical engine with a cylinder open at the top, in which a heavy piston was forced up by explosion of a gas-air mixture at the bottom, and did work on descending by its own weight. This engine was not a success, but ten years later Otto made the first practical use of a cycle of operations suggested by Barnett in 1838 and worked out by Beau de Rochas in 1862. During the induction stroke a mixture of air and gas was drawn into the cylinder, compressed during the return stroke, ignited by a gas flame at inner dead centre, and driving the piston forward by expansion, the burnt gases being expelled during the return stroke. This is the 'four-stroke' or Otto cycle. The main features which gave this engine its superiority over all previously built, and which were clearly realised by Otto, are that compression precedes ignition, and ignition is accurately timed.

Fig. 3 shows the Otto cycle diagram. AB represents the first or charging stroke of the cycle, when the mixture is being

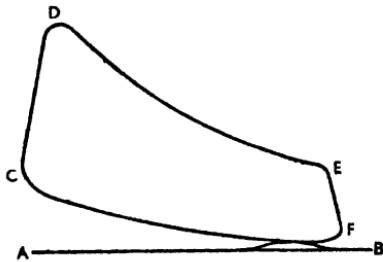


FIG. 3. OTTO CYCLE

taken in at what is practically atmospheric pressure. BC corresponds to the compression stroke. Ignition takes place at C, and the pressure rapidly rises as shown by the steep curve to D. DEF indicates the ordinary expansion and consequent gradual fall of pressure. Towards the end of this stroke the exhaust valve opens, allowing the waste gases to escape, with the resultant sudden decrease in pressure, as shown by EF. So CDEF represents the full effect of the working stroke. Then as the piston moves back over the exhaust stroke, and gradually sweeps the chamber clear, the pressure falls back to the atmospheric level, as shown by FA.

The irregularity of motion arising from the fact that only one stroke in four is a power stroke may be partly overcome by using a large flywheel, or two or more cylinders may be used on the same crank-shaft, and their action so timed that uniformly distributed impulses are given to the shaft, but in any case an engine working on the four-stroke cycle will have greater weight per h.p. developed than

one working on a two-stroke cycle. A two-stroke gas engine was invented in 1880 by Dugald Clark. Gas and air were mixed and slightly compressed in a separate cylinder (the 'displacer') and discharged into the working cylinder at the end of the power stroke, as the piston overran and uncovered the exhaust port-holes in the cylinder wall. Owing to the compression of the charge in the displacer the charge sweeps out the burnt gases. On the return stroke the piston covers up the exhaust ports, and the charge is compressed, ignition occurs at inner dead centre, the expansion drives the piston forward, and as soon as the exhaust ports are uncovered the new charge is drawn in. Against the advantage of the engine producing one power stroke in every two must be set the addition of the displacer cylinder, but this may be of comparatively light construction, as it deals with the charge at ordinary temp. and low pressure, just sufficient to sweep the combustion products out of the working cylinder. The fact that some of the incoming gases may be mixed with the exhaust and lost, is of minor importance when waste gases are used, as these are produced in large quantities at low cost. All modern G. E. work on either the four-stroke or the two-stroke cycle, and, in addition, may be single-acting or double-acting. In the latter combustion takes place on either side of the piston alternatively.

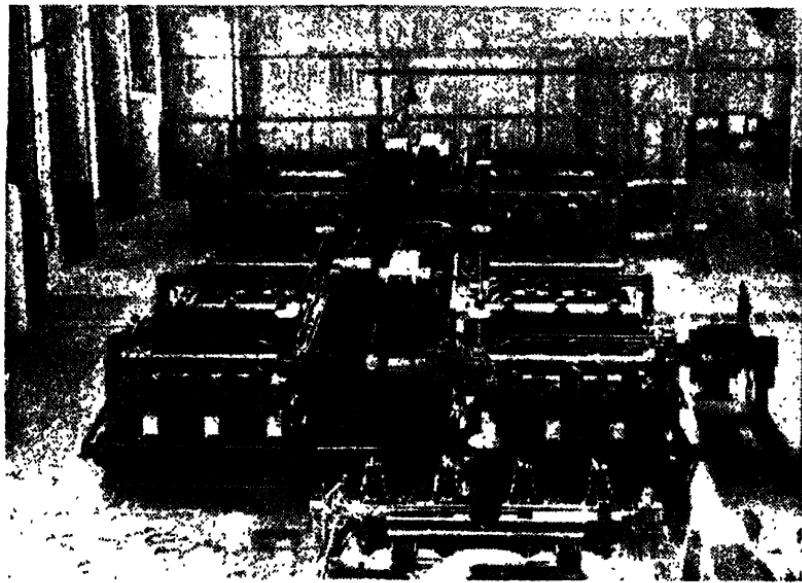
The temp. developed at the explosion in G. E. may reach 2000° C., and exceeds the melting-point of the iron used in the cylinder and piston. It is therefore necessary to enclose the cylinder in a jacket in which cooling water is circulated. But as heat is thereby extracted from the working substance the efficiency is appreciably reduced. Moreover steep temp. gradients are set up in the wall, from the explosion temp. to that of the cooling water, and, further, the cylinder wall is alternately heated (at explosion) and cooled (at expansion), and this temp. variation only penetrates a thin layer of the inner wall. This uneven and varying heating gives rise to cracks in the material and may lead to complete breakdown. Two methods have been suggested for dealing with this problem. In one method, due to Messrs. Crossley, a small spray of water is introduced into the cylinder during suction, the mist is converted into steam at the explosion thereby absorbing heat from the gases, but the steam also expands. Tests have shown an appreciable increase in efficiency over that of an engine working with water jacket only. The other method, suggested by Clark, consists in the injection of a further charge of air at the end of the suction stroke, thus increasing the compression without raising the explosion temp. Tests showed an increase in thermal efficiency from 27 per cent to 34 per cent.

The usual vertical or horizontal ball governors (see STREAM ENGINES) are used on G. E. in three different ways, acting on a lever which (1) cuts off the entire fuel supply for one or more strokes until

normal speed is restored ('hit and miss,' used on small engines only), or (2) cuts off part of the fuel (gas), thus reducing the thermal value of the mixture ('quality governing'), or (3) throttles the mixture on entering the cylinder, thus reducing the pressure. This is the method of 'quantity governing,' and is now used on all large engines.

Ignition of the gases was effected in the Otto engine by a gas flame admitted

80-300 r.p.m. Modern developments mainly concern the cooling and governing systems. Two types of continental two-stroke engines merit special mention, the Koerting double-acting engine in which the long piston acts as part of the valve gear by covering and uncovering the exhaust port as explained above, and the Bechelhauser engine in which there are two pistons in the cylinder, moving alternately towards and away from



Crossley-Premier Engines Ltd

CROSSLEY-PREMIER 1500 B.H.P. GAS ENGINES IN DUPLICATE SET

This is the largest British-made set in the world, operating on natural gas, in Trinidad. Each engine has twelve cylinders arranged in four groups of three. Two of these groups are placed *vis-à-vis* fashion on each side of a centrally disposed flywheel, to the arms of which the rotating field of the 1000-kw. alternator is bracketed.

to the cylinder by a valve operated and timed by the engine itself. This method was later superseded by the hot-tube method, in which part of the gases pass through a short porcelain or platinum tube kept hot by a gas flame. Modern engines use ignition by electric spark, the spark gap being placed in the cylinder, and usually supplied by a high-tension magneto (see MOTOR CARS).

Starting of small G. E. can usually be done by hand, but for engines larger than 30 h.p. it is necessary to have some other means of starting. Some engines are started by introducing a small explosive charge, but more often a special compressor is used or the valves are so set as to make the engine start as a compressor.

G. E. are made in sizes up to about 3000 h.p., and usually run at speeds of

one another. The Fullagar engine works on a similar principle.

Gases, Inert, Noble, or Rare, see RARE GASES.

Gases, Nascent, see NASCENT STATE.

Gaskell, Elizabeth Cleghorn (1810-65), Eng. novelist, b. at Chelsea. She was the daughter of Wm. Stevenson, a Unitarian minister and keeper of the treasury records. Most of her youth was spent at Knutsford, Cheshire, and this quaint tn. supplied her with her material for *Cranford*. In 1832 she married the Rev. Wm. G., a Unitarian minister of Manchester, and the marriage proved a very happy one. In 1848 she became famous by the pub. of her novel *Mary Barton*, in which she reflects with insight and sympathy the life and feelings of the manufacturing working classes. The book was a

great success and was praised by Carlyle, Maria Edgeworth, and Landor. She was a friend of Dickens, and was intimately acquainted both with Carlyle and Thackeray. It was at Dickens's invitation that she wrote for *Household Words*, and in this paper appeared, from 1851 to 1853, *Cranford*, which, according to Lord Houghton, is 'the purest piece of humoristic description that has been added to Brit. literature since Charles Lamb.' She has some of the characteristics of Jane Austen, and if her style and delineation of character are less minutely perfect,



ELIZABETH CLEGHORN GASKELL

they are, on the other hand, imbued with a deeper vein of feeling. She was the friend of Charlotte Brontë, to whom her sympathy brought much comfort, and whose life she wrote (1857). Her other novels were *Lizzie Leigh* (1853), *Ruth* (1856), *North and South* (1855), *Syria's Lovers* (1863), and *Mr. Harrison's Confessions* (1867). Her last work was *Wives and Daughters* (1865), which appeared in the *Cornhill Magazine*, and was left unfinished. The fullest ed. of her works is that of C. K. Shorter (11 vols., 1906-19). See E. A. Chavasse, *Mrs. Gaskell: Haunts, Homes, and Stories*, 1910, and Elizabeth Isham, *Mrs. Gaskell and Her Friends*, 1930; also lives by J. J. van Dullemen, 1924; G. A. Payne, 1929; A. S. Whitfield, 1929; and G. de W. Sanders, 1930.

Gas-liquor, watery fluid which, together with coal-tar (*q.v.*), forms the liquid product of the distillation of coal. This liquor, which separates as a layer above the tar, consists chiefly of a solution of ammonium salts, partly condensed from the hot gases and partly derived from the subsequent washing of the gas in the scrubbers. The carbonate and chloride are the most important of the salts present and occur to the extent of about 4 and 1·5 per cent respectively. Smaller quantities of the sulphide, thiosulphate, and sulphate are also present. G. was at one time the most important source of

ammonia from the commercial point of view. This product is obtained from it by decomposing with lime, and blowing over the ammonia with steam. If the sulphate, which is largely used as a fertiliser, is required, the gas is passed into sulphuric acid, and the salt crystallised out. Nowadays G. is of minor importance as a source of ammonia, which is mostly prepared synthetically from hydrogen and nitrogen.

Gas Manufacture. Gas is made by the destructive distillation of that variety of coal, rich in hydrogen, known as bituminous coal. A typical bituminous coal has the following composition: Carbon, 77 per cent; hydrogen, 5 per cent; sulphur, 1·7 per cent; nitrogen, 1·7 per cent; oxygen, 7 per cent; ash, 3·5 per cent; moisture, 3·4 per cent.

The products of the distillation of coal may be divided into three main classes: (a) Solids such as coke and gas carbon; (b) liquids consisting of tar and ammonia-licor; (c) gases consisting of the unpurified coal gas. The coal-tar contains, among many other bodies: (1) Benzene and its homologues, from which aniline, the source of coal-tar colours, can be derived; (2) carbolic acid, from which picric acid, used as a dye and a powerful explosive, is made; (3) naphthalene, used for disinfecting; (4) pitch, extensively used for road-making. From the products obtained by the distillation of the tar (*q.v.*) many valuable drugs, perfumes, and colouring matters are obtained.

The gases may be divided into (1) light hydrocarbons, such as methane, acetylene, ethylene; (2) other combustible gases, such as hydrogen, carbon monoxide; (3) impurities such as nitrogen, hydrogen sulphide, carbon disulphide, and other organic sulphur compounds, carbon dioxide, ammonia. Of the last class, ammonia and hydrogen sulphide are completely extracted by purification processes, and frequently most of the organic sulphur compounds are also removed.

The series of operations involved in G. M. embraces the processes of distillation, condensation of the products of distillation which are liquid or solid at atmospheric temp., exhaustion of the uncondensed gas from the retorts, wet purification, by washing with water, dry purification, estimation of the volume of the purified gas, and distribution to the mains from which the customer draws his supply. From the accompanying diagram an idea of the order in which operations in G. M. are carried out, and the arrangement of the plant, can be gained.

Retorts. -The distillation of coal is carried out by the following systems: (1) Horizontal retorts; (2) continuously operated vertical retorts; (3) intermittent vertical retorts or chambers; (4) coke ovens. Although in some large gas undertakings the last mentioned are now being installed for the production of tn. gas, they are mainly used for the production of hard coke for the steel industry, and most of the tn. gas supplied by the gas industry is made in horizontal or vertical retorts.

Horizontal Retorts.—These are made of fire-clay or silica; their cross sections are usually D-shaped, a form adopted on account of the large heating surface presented by the base and the fact that it remains unchanged after continued heating. To the open ends of each retort a cast-iron mouthpiece is bolted; this carries a socket to receive the pipe through which the gases pass after leaving the retort. The retorts are heated externally, being arranged in 'beds' of from three to twelve. Each bed of retorts has a separate furnace. The retorts are heated by the combustion of producer gas which is made by the passage of air through red-hot coke in a furnace or 'producer' placed below the bed of retorts. The oxygen of the air is

of coke. Formerly horizontal retorts were charged by hand, but they are now almost entirely effected by machinery operated by compressed air or hydraulic or electric power. Various types of machines are available for the purpose, some of which charge from one side of the retorts only, others charging simultaneously from both sides. In some of these machines the principle of the conveyor chain is employed, while in others, of the projector type, the coal is thrown into the retort from a rapidly rotating belt by centrifugal force. The coke is discharged from the retorts by means of a telescopic ram which enters the retort at one end, pushing the red hot coke out at the other.

Vertical Retorts.—Carbonisation in

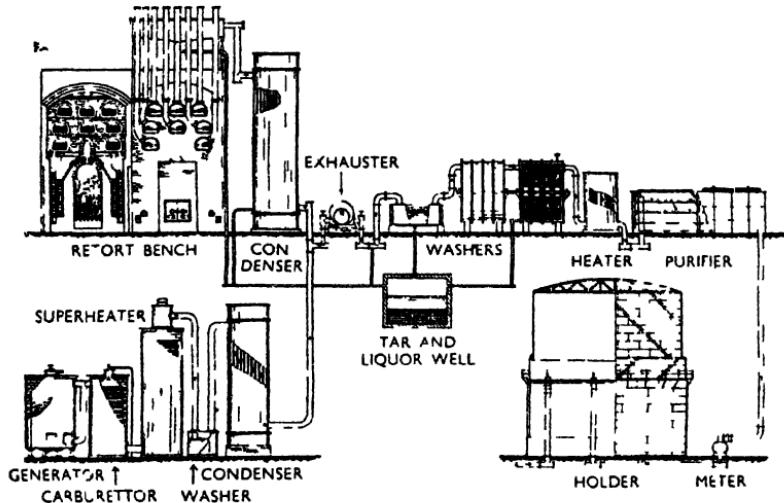


DIAGRAM OF A COAL GAS PLANT

The lower left hand position shows carburetted water gas plant, which is not always used.

converted into carbon monoxide, and the mixture of carbon monoxide and nitrogen enters the combustion chamber surrounding the retorts at a high temp., It is here supplied with sufficient air to complete the combustion of the carbon monoxide to carbon dioxide, a reaction which is accompanied by the evolution of a great quantity of heat. It is usual to have an admixture of steam with the primary air supply which forms carbon monoxide and hydrogen by contact with the hot coke. This system of heating possesses the following advantages. (1) A great economy of fuel; (2) a high temp., (3) a uniform distribution of heat around the retorts. In modern installations the heat in the waste gases is used to preheat the secondary air used for combustion of the producer gas in recuperators, thus effecting a considerable economy in fuel. With a modern recuperative setting it is possible to carbonise 100 lb. of coal by the use of only 12 lb.

vertical retorts may be continuous or intermittent. In the case of the former coal is fed continuously into the top of a retort by means of gravity, and is carbonised in its passage through the retort, coke being extracted by a slowly moving mechanical extractor at the base. As the coal is carbonised it swells considerably, and in consequence the retorts are wider in both dimensions at the bottom than at the top. The retorts in cross-section are either rectangular (e.g. Woodall-Luckham system) or oval (e.g. the Glover-West system) and are of various sizes to carbonise from 3 to 12 tons per day. The actual amount of coal passing through the retort depends upon the class of coal being carbonised and the calorific value of the gas produced. Steam is introduced at the base of the retort for the primary purpose of cooling the coke before it is discharged, but in so doing it produces water gas, thus increasing the gaseous yield. With continuous

vertical retorts there is great possibility of flexibility in output and calorific value through variations in the rate at which coal is carbonised and in the amount of steaming. Steam is generated in waste-heat boilers in which the heat of the waste gases is utilised. Carbonisation in intermittent vertical chambers is not unlike that in horizontal retorts, except that coal is fed into the retort by gravity from overhead charging machines, and the coke is similarly discharged by gravity into a coke car, which is then cooled by means of water in a quenching tower. Intermittent vertical retorts or ovens are made in various sizes to accommodate charges of from 1 to 5 tons. Full accounts of various installations of continuous and intermittent vertical retorts may be found in the *Transactions of the Institution of Gas Engineers*.

Hydraulic Main.—The gas passes from the retort to the hydraulic main. This is a long horizontal tank supported above the top of the retort stack, through which is maintained a constant slow stream of water, the level of which is not allowed to vary. The ascension pipe dips about 1 in. into the water, which acts as a seal to allow any retort to be charged singly without the possibility of gas produced in the other retorts of the same bed escaping through the open retort. Some of the high boiling constituents in the gas condense in the ascension pipe, which must be periodically cleaned. In the hydraulic main, where the gas bubbles through water, condensation takes place to a still greater extent, and also solution of a considerable quantity of ammonia. The products of condensation form a black, viscous fluid of peculiar smell called coaltar, which is a mixture of an extremely complex character. The tar, being heavier than the ammonia liquor, forms a layer at the bottom of the main, and the ammonia liquor is run off from the top of it at a constant rate into a storage tank. The gas leaves the main at a temp. of about 60° C., and is reduced to the temp. of the air by condensers which are air-cooled or water-cooled, or both. Water condensers are more efficient, because the degree of cooling can be better regulated with water than with air. The efficiency of a condenser is judged by the efficacy with which it removes naphthalene; this compound condenses to a white glistening solid, which causes great trouble when it is deposited in the works or distributing pipes.

The Exhauster.—Since the stream of gas has to work against the pressure of the seal in the hydraulic main, the pressure of the gas in the retort must be greater than the pressure in the combustion chamber surrounding it. Some of the gas would naturally percolate through the porous wall of the retort and be consumed in the chamber. The exhauster is a rotary gas pump, which serves the purpose of sucking the gas out of the retort and thus neutralises the effect of the water pressure. The exhauster also serves to force the gas through the purifying plant. The amount of gas produced is increased

through the use of an exhauster by about 10 per cent and, moreover, the quality of the gas is improved, because it leaves the heated retort more quickly. After leaving the condensers, the gas contains the following impurities which must be removed: (1) Hydrogen sulphide; (2) carbon bisulphide; (3) carbon dioxide; (4) ammonia.

Wet Purifiers or Washers.—These contain ammonia liquor through which the gas is made to flow in finely divided streams. The compounds hydrocyanic acid, carbon dioxide, and hydrogen sulphide are acidic, so they combine with the ammonia (a strong base) to form salts which are non-volatile. The greater proportion of these impurities are therefore removed. The final removal of the ammonia is effected in the scrubber or washer.

Dry Purifiers.—The final purification is effected by passing the gas over wooden trays made in the form of grids and covered with the purifying material. Oxide of iron, called bog iron ore, is used as the purifying agent. The oxide of iron removes the last traces of hydrogen sulphide. Sulphide of iron is formed, and the spent oxide is revivified by exposing it to the air, the oxygen of the air displacing the sulphur from the sulphide. When the sulphur has accumulated to the extent of about 50 to 60 per cent the material does not suffer revivification on exposure to the air; it is then sold to manufacturers of sulphuric acid to be roasted in kilns for the production of sulphur dioxide. The gas passes from the purifier to the gas-holder where it is stored. In small gas-works the holder is a simple cylindrical vessel inverted in a tank of water. Large gas-works have adopted a telescopic cylindrical vessel, thus saving much ground space, as the same sized tank serves for a holder of much greater capacity than the simple form. The tankless holder consists of a tall cylinder or polygon in which the gas is confined by a large sealed piston which rises and falls according to the amount of gas in the holder. Such a holder gives the same pressure whatever the height of the piston. The holders of this type now constructed in Great Britain have an aggregate capacity of about 74,000,000 cub. ft. An advantage of these holders is that, not being stored over water, the gas does not go into the mains saturated with water vapour, as is the case with ordinary holders.

Gas for fuel or power is prepared by the incomplete combustion of coal or coke. There are two methods of producing gaseous fuel, entirely different in principle: (1) Air is passed upwards through a deep layer of red-hot carbon. The carbon combines with the oxygen of the air to form carbon monoxide, CO. The nitrogen of the air is unaffected, so the resulting gas consists of a mixture of carbon monoxide and nitrogen, with a small percentage of carbon dioxide, CO₂. This mixture is called *producer* or *Siemens' gas*. (2) Steam is passed through the red-hot carbon, when the following reaction takes place, C + H₂O = CO + H₂. The mixture of CO

and H is called *water gas*, which evidently differs from producer gas in that it is wholly combustible. The reaction by which water is produced is endothermic in character, because the amount of heat required to decompose 1 grammie molecule of steam is greater than the amount of heat liberated when C combines with O to form CO. This explains why steam directed upon incandescent coke will produce water gas only for a very short time. The heat required for the reaction is absorbed from the hot coke which is cooled to such an extent that at first a gas of different composition from water gas is formed, and quickly the process ceases altogether. This difficulty is overcome by blowing air and steam alternately through the coke for periods of a few minutes each. During the first stage the carbon is converted into carbon dioxide, a reaction which liberates a large amount of heat. This heat is employed in raising the temp. of the remaining mass of fuel which soon attains the temp. appropriate for the reaction $C + H_2O = H_2 + CO_2$. This reaction, being endothermic, abstracts heat from the hot fuel which cools down, so that the process must be reversed by blowing air in, and so on. Hence in all processes for the manuf. of water gas, two alternating operations are involved: (1) The temp. of the fuel is raised to about $1200^{\circ} C.$ by blowing a current of air through it; (2) steam is injected until the temp. falls to about $900^{\circ} C.$ If the temp. falls below $900^{\circ} C.$ the reaction $C + 2H_2O = CO_2 + 2H_2$ predominates.

Coal gas, water gas, and producer gas are all widely employed for industrial purposes, since they form clean, reliable, and easily manipulated fuels. By the Gas Regulation Act of 1920 coal gas is now sold not by the cubic foot as previously, but by heating power measured in thermus (see also BELBY). One therm is equal to 100,000 Brit. thermal units, i.e. it is the amount of heat required to raise the temp. of 100,000 lb. of water one F. degree. See A. Meade, *New Modern Gasworks Practice*, 1934, and A. Key, *Gasworks Effluents and Ammonia*, 1938. See also GAS AUTHORITY, BRITISH.

Gas Meter. The G. M. was invented about 1815 by Clegg. Consumers' G. Ms. are either wet or dry. The wet type has a measuring drum enclosed in a case containing water up to a level known as the water-line. The drum, which contains div. plates set at an angle, is caused to revolve by the gas pressing upon the surface of the water, arrangements being made to compensate for fluctuations in water level due to movement of the drum. The rotation of the drum spindle is communicated to a train of wheels and registered on dials.

The dry meter, which is much more extensively used, usually has a case of tinned iron, and is divided into one horizontal and two vertical compartments by div. plates. In each vertical compartment is a movable diaphragm with prepared flexible leather sides, thus making four chambers in the lower part of the meter. The gas enters and leaves the chambers

alternately through valves which are made to open and close at the correct time. The alternate expansion and contraction of the diaphragms, like ordinary bellows, by the pressure of the gas is communicated by levers and cranks to the recording mechanism. There are various forms of pay-payment or slot meters for extending the sale of gas among the smaller consumers. By means of a simple mechanism attached to the meter, and operated by the insertion of a coin, an amount of gas appropriate to the value of the coin is allowed to pass through the meter, after which a valve closes until another coin is inserted. Meters, as tested under the provisions of the Gas Act, 1948, are stamped as correct when their registration does not vary from the standard by more than 2 per cent in favour of the seller or 3 per cent in favour of the consumer, a total range of 5 per cent.

Gas, Olefiant, see ETHYLENE.

Gasolene is that fraction of petroleum boiling at about $115^{\circ} F.$, and is used for burning in vapour lamps, as a fuel in internal combustion engines, and as a solvent in the arts. See PETROLEUM.

Gasometer, see under GAS MANUFACTURE.

Gasparri, Pietro (1852-1934), It. cardinal, b. at Ussita. Educated, Pontificio Seminary, Rome. Prof. of canonical law, Catholic Institute, Paris, 1880-98. In 1898 went to S. America as apostolic delegate, where he remained until 1901. Entrusted, 1904, by Pius X. with codification of canonical law. Cardinal, 1907; secretary of state, 1911. Conducted negotiations leading to treaty between Vatican and It. Gov., which was signed Feb. 11, 1929.

Gaspé Peninsula, E. section of the prov. of Quebec, Canada, between gulf of St. Lawrence and Chaleur Bay. It consists mainly of forest land and has good fisheries. Area 4450 sq. mi. Pop. 41,000.

Gas, Poison, see CHEMICAL WARFARE.

Gas Poisoning, see under POISONS and RESUSCITATION.

Gasquet, Francis Aidan (1846-1929), Eng. historical writer, b. in London. He was educated at Downside College, Bath, and from 1878 to 1884 was superior of the Benedictine monastery and college of St. Gregory, Downside. Up to his death was the abbot president of the Eng. Benedictines and president of the international commission for the revision of the Vulgate, in virtue of which he was created cardinal-deacon by Pius X. in 1914. On the occasion of his sacerdotal jubilee Pius XI. raised him to the dignity of cardinal-priest. He was the leading authority on pre-Reformation monasticism in England. His works include *Henry VIII. and the English Monasteries* (1888-89), *A Short History of the Catholic Church in England* (1903), *English Monastic Life* (1903), *Vita Antiquissima B. Gregorii Magni* (1903), *Henry III. and the Church* (1905), *Collectio Anglo-Premonstratensis* (1906—vol. I. had been previously pub. in 1904), *Parish Life in Mediaeval England* (1908), *The Greater Abbeys of England* (1908), *Monastic Life in*

the Middle Ages (1922), and *His Holiness, Pope Pius XI.* (1922). He ed. Count Montalomberi's *Monks of the West* (1896).

Gassendi, or Gassend, Pierre (1624-1655), Fr. philosopher and mathematician, b. at Chantemerle in Provence. He studied at Aix with a view to entering the Church, but abandoned the idea and took up the study of philosophy. He made an examination of the Aristotelian systems, and pub., in 1624, *Exercitationes paradoxicae adversus Aristoteleos*, in which he protests against the acceptance of the dicta of Aristotle as final in all matters of philosophy. In 1635 he was made prof. of mathematics at the Collège Royal in Paris. While in Paris he wrote *De vita Epicuri*, a commentary on Diogenes Laertius's tenth book, and *Syntagma philosophiae Epicuri* (1649), which contains a complete sketch of the system of Epicurus. G. was a disciple of Bacon and on friendly terms with Galileo, keeping pace with the moderns in natural and physical science just as he referred to the ancts. His *Institutio astronomica* is a book on the science of his own day, while *Tychonis Brahe, Nicolai Copernici, Georgii Puerbochii et Joannis Riccomonti Vitae* contains a complete hist. of astronomy down to his own time. See Bugrel, *Vie de Gassendi*, 1737. His life is also given by Damiron, *Mémoire sur Gassendi*, 1839. An abridgment of his philosophy was written by his friend, the traveller, Bernier (*Abrége de la Philosophie de Gassendi*, 2nd ed., 7 vols., 1684). See also P. Pendzig, *Die Metaphysik Gassendis*, 1908; P. Humbert, *L'œuvre astronomique de Gassendi*, 1936; and study by La Mothe-Vayer, 1943.

Gasset, José Ortega y, b. in 1883 and for some years prof. of the univ. of Madrid. Like so many of his univ. and literary contemporaries, he is considered to be one of the true inspirors of the Sp. revolution which came to a head in 1931. Six vols. of his collected essays bear the title *The Spectator*. In his review *La Revista de Occidente*, and in other works, he showed himself to be a sharp critic of the monarchical gov. and of the dictatorship in Spain. The best known of these books are *Meditations of Quirote* (1914) and *Invertebrate Spain* (1922, Eng. trans. 1937).

Gas Space Heaters. As a fuel gas is clean and produces neither smoke nor soot, no fuel storage space is required, nor is the removal of ash involved. A gas fire will give an immediate and flexible supply of heat; the temp. of a room heated by a gas fire can be kept under close control merely by the operation of the tap on the fire. Since a gas fire is normally fitted to a flue, it will promote adequate and positive ventilation of the room in which it is installed; a coal fire, on the other hand, needs a much larger flue to dispose of the smoke produced and, in consequence, causes a much higher rate of ventilation than is needed. This results very often in unpleasant draughts and an undesirable wastage of heat up the flue.

Most of the heat from gas fires is by radiation, but later types, called convector

fires, produce in addition a certain amount of convected heat in the form of warmed air, which is directed into the room and which further increases the total heat output of the fire. Gas fires of both the radiant and convective types are designed to give an efficient and wide distribution of heat, the first type in the form of well distributed radiant heat, and the latter with an additional circulation of warm air. The output of heat from a gas fire, as compared with the heat input in the form of fuel consumed, is about 50 per cent in the case of the normal fire, and 60 to 65 per cent in the case of a well-designed convector fire. The modern gas fire is silent in operation, and requires very little attention to maintain it in good working order; it has radiants, which are much more robust than the older types. Automatic ignition is usually provided.

From an artistic point of view gas fires can be made to harmonise with any scheme of decoration. They may be designed to be fitted at hearth level or raised to a convenient height to form a panel nearly flush with the face of the wall. Small portable gas fires are also available to give local warmth by radiant or convected heat, or a combination of the two. These, as a general rule, need no flue. Another form of domestic gas heater is the flueless radiator, which either stands on the floor or is fixed to the wall; this heats mainly by convected warm air which gives a background of warmth to the whole house. Many premises of a commercial and industrial character are heated by gas convectors of a larger size than the domestic type, and also by overhead heaters of various designs which employ radiation to warm the occupants of the premises. Gas space heating appliances lend themselves admirably to automatic controls arranged to maintain the temp. of the premises at a desired level.

Gastein, valley in the prov. of Salzburg, Austria. Its two prin. vils. are Hofgastein and Wildbadgastein. Hofgastein is the cap. of the valley and also a watering place. Wildbadgastein is noted for its thermal springs.

Gaster, Moses (1856-1939), Rumanian philologist and Heb. scholar, b. at Bucharest, educated at Bucharest Univ. Lecturer of Rumanian language and literature at that univ. 1881-85, but exiled from Rumania for agitating on behalf of the persecuted Jews. In 1886 and 1891 he was Ilchester lecturer at Oxford on Slavonic and Byzantine literature; and in 1887 he was appointed chief rabbi of the Sephardic communities of England. Held Rumanian orders 'Bene Merenti' (1st class), for literary achievements. His earlier works include *History of Rumanian Popular Literature* (1883); *Rumanian Translation of the Hebrew Prayer-Book* (1883); *Græco-Slavonic Literature* (1887); his later, *The Hebrew Version of Secretum Secretorum of Aristotle* (1908); *The Jewish Divorce* (1911); *Romanian Fairy Tales* (1923); *The Samaritans* (1925); *Samaritan Eschatology* (1932); *The Mosaic Book* (Eng. trans. 2 vols., 1934); and contributions to the *Encyc.*

Brit. and Hastings's Encyclopaedia of Religion and Ethics.

Gasteropoda (Gk. γαστήρ, stomach, and πόδις, foot), name given to one of the three large classes into which molluscs are divided and, as the name indicates, all its genera are characterised by the ventral position of the foot. Gasteropods are subdivided into Isopleura, symmetrical, and Anisopleura, unsymmetrical forms. The former contain the simplest and most primitive molluscs, such as *Chiton*; they are elongated in form, the mouth being at one end and the anus at the other end of the body; the pedal and visceral nerve-cords run parallel to one another the whole length of the body; and the gills, kidneys, genital ducts, and circulatory organs are bilaterally symmetrical; *Neomenia* and *Proncomenai* are small flat forms whose shells consist only of minute plates and spines in the skin; species of *Chelotrema* are more elongated and cylindrical, but their shells are also rudimentary; *Chiton* has eight dorsal shell-plates, fitted one behind the other. In the Anisopleura the head and foot are bilateral, but the viscera are twisted, bringing the gills, kidneys, and anus to the right side; the reproductive organ and genital duct are single. The free-swimming forms known as Heteropods sometimes acquire a superficial symmetry. The Streptoneura, as their name implies, are Anisopleura in which the nerve loop is twisted, owing to the asymmetry of the viscera already mentioned—they include *Patella*, the limpet, *Littorina*, the whelk, *Purpura*, the dog-whelk, etc.; the Euthyneura, or straight-nerved, include the Opisthobranchs, *Aplysia* (the Sea Hare), *Bulla*, *Doris*, *Colis*, etc.; and the Pulmonata *Helix*, the snail, *Arion*, the black slug, etc. Gasteropods are voracious animals, being furnished with powerful rasping organs which enable them to prey on other marine molluscs, while the terrestrial forms, such as snails, work havoc among flowering plants and vegetables; many of them—whelks, etc.—are used for human consumption and as bait. Fossil gasteropods occur in the Cambrian rocks, and many modern types have their origin in Cretaceous times.

Gaston de Foix, see FOIX and FOIX, GASTON.

Gastrectomy. This operation consists in 'cutting out the stomach,' that is, removal of part or the whole of the stomach wall for the purpose of excising an ulcer or a cancer. The operation of gastroenterostomy consists in making a passage from the stomach to the small intestine—in fact, short-circuiting the duodenum—so as to prevent the food passing over and stopping the healing of an ulcer of the stomach wall or duodenum. Gastrostomy consists in making a mouth to the stomach, and is an operation performed in order to prevent the food passing through the throat and gullet. Gastrotomy is a term incorrectly applied to laparotomy (cutting open the abdomen), meaning an exploratory operation inside the abdomen.

Gastric Catarrh, running or excess of

moisture (mucus) from the wall of the stomach. It is due to changes in the wall arising from the contents of the stomach, to injurious substances circulating in the blood, or to changes in the nerve supply.

Treatment.—As G. C. is caused or maintained by the food supply, a restricted diet or entire abstinence from food is indicated, and alcohol should be avoided. Discomfort may be prevented by sipping hot or cold water.

Gastric Juices, colourless acid fluid, secreted by certain cells in the stomach, containing enzymes and hydrochloric acid in addition to small amounts of organic and inorganic materials. The main enzyme, or ferment, present is pepsin, which is derived from a precursor, propespin. The latter, on coming into contact with acid, is converted into the ferment which acts upon the protein of the food. Pepsin therefore can only act in acid solution, and both the ferment itself and the hydrochloric acid of the G. J. are secreted by special cells in the stomach. The amount of the secretion, and also its composition, is determined by the nature of the food. Pepsin acts on protein matter, converting it into soluble forms, albumoses and peptones, which are passed on to the intestine, there to undergo further change. Another ferment, rennin, is also present in G. J.; it brings about the clotting of milk by catalysing the change of caseinogen into casein.

Gastritis, see STOMACH; (in horses), see HORSES, Diseases.

Gastrolobium, a genus of leguminous plants, contains over thirty species, all of which are evergreen shrubs found in W. Australia.

Gastronomy, the science of eating, is inseparable from its application and is therefore an art as well as a science. The first gastronomical experiments were probably purely accidental, but for over three thousand years deliberate experiments have been made. The earliest gastronomists discovered that cooked fish and meat were more appetising than raw foods. More recent experiments have given us the *sauce tartare* with the sole, mint sauce with lamb, and red currant jelly with game. In the experimental field the Fr. have been the foremost gastronomists, and have discovered many attractive and unusual food combinations. Like most arts that of G. has frequently been debased, for at many periods in hist. it has degenerated into gluttony. For the consumer the best expression of the art is in the enjoyment of appetising dishes eaten with the fullness of appreciation that is accompanied by restraint. Modern G. as a science has to consider not only the combination of appropriate flavours, but also the food value of the dishes. This value is generally expressed in calories, the units of heat which may be supplied to the body by the food. It is estimated that a working man of average size needs from 2500 to 3000 calories per day, and tables have been prepared to show the numbers of calories to be obtained by given weights of various foods; for instance, a large egg

yields about 100 calories. Consequently in the preparation of menus for the day's meals, the foods have to be selected to give sufficient but not too much heat energy, and then by means of subtle flavouring and exquisite cooking the science and art of G. are combined. See also COOKING; DIET; FOOD AND FEEDING. See A. Brillat-Savarin, *Physiologie du goût*, 1825; Sir F. Colchester-Womys, *The Pleasures of the Table*, 1831; and E. and Lorna Bunyard, *The Epicure's Companion*, 1937.

Gastrula, in zoology an organism of which the stomachal cavity is the most prominent. From a physiological standpoint G. represents the simplest type with cellular differentiation. It appears in the development of almost all groups of the animal kingdom as a free swimming larva, and to which the adult sexually mature (Calecentrate) closely approximates. *Amphioxus* shows the development excellently. A hollow ball of cells (blastophore) suffers invagination of one part of its wall upon another, yielding a thimble-shaped G. in which the external layer of cells (ectoderm) and the internal (endoderm) surround a central cavity (arch-enteron) which communicates with the exterior by means of the blastopore or the orifice produced by the narrowing of the aperture of invagination. Haeckel believed that in G. he had found the stage common to the development of all cellular organisms.

**Gas Turbine Engine, see under AERO-
ENGINES and JET PROPULSION**

Gas Water Heaters. Modern G. W. H. fall under two main headings: instantaneous and storage. In the former water is heated as it passes through the appliance; the supply is instantaneous and continuous so long as the hot-water tap is turned on. In the latter a quantity of water is heated and stored for use as desired. Single point instantaneous heaters serve one hot tap; multipoint heaters can deliver hot water to every hot tap in the home. They have a high thermal efficiency, but the rate of gas must be sufficient to provide the heat needed to cope with the rate of flow of the water. The multipoint heater is connected up to a cold-water supply, and to the hot-water pipes of the house. It incorporates a small pilot jet, and operates automatically by the opening and closing of the hot tap at bath, basin, or sink. A common type of multipoint heater delivers about two gallons of hot water per minute at bath temp. The provision of an automatic device prevents gas passing to the main jets should the pilot be extinguished. Bathrooms in which instantaneous G. W. H. are fitted must have adequate ventilation.

Storage G. W. H. can be subdivided into two types: the circulator and the self-contained storage heater. The circulator is designed for connection by external flow and return pipes to an independent storage cylinder which should be lagged, or it can be inter-connected with an existing system to work as an alternative to, or in conjunction with, a solid fuel boiler. In the latter case the existing storage cylinder is

used. The self-contained storage heater consists of a completely lagged storage vessel and a heating unit as one appliance and can, if required, be connected to an existing system to work as an alternative to a solid fuel boiler. In both cases the rate of draw-off is determined by the head of water available, by the bore of the draw-off pipe to, and the size of the tap concerned.

With storage water heaters water is heated until the full quantity is stored at the predetermined temp. in a tank or cylinder, which should be insulated; the gas consumption is then automatically reduced by thermostat to a rate sufficient to maintain the water at that temp. When hot water is drawn off the gas rate is automatically increased. Instantaneous and storage heaters are made in sizes to serve the kitchen sink or the whole house; some types provide hot or boiling water for kitchen needs. In the home gas is also used for heating the water in boilers and washing machines used for clothes washing. Large gas-fired plants provide hot water for commercial premises or heat the water in swimming baths. Specially designed heaters provide a continuous supply of boiling water for use in caf s, restaurants etc.

Gatacre, Sir William Forbes (1843-1906), Brit. soldier, b. near Stirling. In 1898 he went to Egypt to command the Brit. brigade in the advance up the Nile for the recovery of Khartoum, and took part in the operations which ended with the capture of Omdurman. In the S. African war he made an attempt to seize the railway junction at Stormberg. The attempt was unsuccessful and G. was blamed by Lord Roberts for his want of judgment. In 1900 he failed to come to the assistance of the troops at Reddersburg and was recalled.

Gatchina, or Gatshina, see TROTSK.

Gate and Gateway, military term of the Middle Ages which was used technically to denote the huge barrier which defended the outer entrance to a castle or fort. It was usually made of solid oak, and was swung by means of huge hinges inside an arched 'gateway.' Above the gateway was perforated stonework, through which might be dropped boiling pitch and molten lead on to the heads of the besiegers. The gateway was further defended by a portcullis which often stood down even when the gate was opened. Towers from which a flanking fire could be brought to bear on the attacking party also formed a further protection. The gateway usually stood on the brink of the moat and was still further protected by a drawbridge.

Gate of Tears, strait of Bab-el-Mandeb, in the Red Sea, so called from the shipwrecks associated with it.

Gateshead, municipal co. and parl. bor. of Durham, England. It is situated on the opposite bank of the Tyne to Newcastle, a tn. with which it is very closely connected. It is reached and served by the N.E. Region of Brit. Railways. The tn. has been very largely restored since the great fire of 1854, which destroyed a very large part of it. The riv. is bridged

in five places, and so connects the tn. with Newcastle. The Shipcote dist. in the centre of the tn. has many buildings noted for their architectural beauty; these include the Shipley Art Gallery and the Central Public Library. There is a fine grammar school, besides technical and art schools. The Queen Elizabeth Hospital (maternity and general wings), opened in 1943, and the Infectious Diseases Hospital, both at Sheriff Hill, provide the most modern hospital services. In Saltwell Park, 67 ac. in extent, G. has one of the finest tn. parks in the N. of England. The tn. has large iron works and foundries, shipbuilding yards, tanneries, and soap works. The industrial feature of the tn. is the Team Valley Trading Estate, of 700 ac. estab. by the gov. and planned for factory accommodation. It has its own internal railway connecting with the local railway station, and recreational centres, etc., for employees. It has attracted many new industries and assisted in the post-war (1945) industrial development of G. G. is thought by some to have been the Rom. military station of *Gabrosentum*, named in the Itinerary (*q.v.*). There has been some doubt as to the origin of the place-name, but it is probably derived from two A.-S. words meaning 'head of a road,' for it was literally the 'head' of the Rom. road that led from Chester-le-Street to Newcastle. G. was first mentioned under its modern name towards the end of the eleventh century, in connection with the burning of the church and murder of the bishop of Durham by the populace—a tragic incident which arose out of the murder of an Eng. nobleman who had protested to the bishop against the exactions of his tax-gatherers. The tn. obtained a charter from the bishop of Durham as lord palatine in 1164, and the common seal of the bor. is referred to in a charter of 1480, the inscription on which ant. charter was 'Sigillum commune de Gatyshedde.' Rivalry and disputes subsequently arose with Newcastle over fishing and trading rights, and in the reign of Edward VI. the two tns. were united for a short time. G. remained under the nominal headship of the bishop of Durham until the end of the seventeenth century. It became a parl. bor. in 1832 and a co. bor. in 1889. The tn. was not given an M.P. until 1832. Some damage was done to the tn. by bombing raids in the Second World War, chiefly to houses and small industrial concerns, but there were few fatal casualties. Pop. (estimated 1946) 113,400.

Gates, Horatio (1728-1806), Amer. general, b. at Maldon in Essex, England. He took part under Braddock in the expedition to Fort Duquesne, which ended in disaster (1755). He escaped with difficulty and settled down in America. On the outbreak of the War of Independence, he sided with the colonists and quickly made a name for himself. He obtained the N. command and forced the surrender of a Brit. army at Saratoga (1779). He then aimed at the chief command of the Amer. Army. In 1780 he was badly defeated at Camden by Corn-

walls, and as a result of a court-martial was superseded. He finally retired to Virginia, and thence to New York, where he d.

Gath, one of the royal cities of the Philistines. It was situated near the borders of Judah, and is held to be the bp. of Goliath. During the early years of the Lat. kingdom of Jerusalem it was fortified by the crusaders. It fell into the hands of Saladin in 1191, but was recaptured in the next year by Richard I. The exact site of the tn. is not now known, but Tell-es-Sai is supposed to occupy it.

Gatineau, riv. of Canada, a trib. of the Ottawa, which has its source in some lakes, situated in about lat. 48° N. and long. 75° 30' W. The direction of its course is chiefly S.S.W., and it eventually enters the Ottawa, after flowing 400 m.

Gatling, Richard Jordan (1818-1903), inventor of the Gatling gun, a species of machine gun. He was an Amer. citizen and an inventor of some note. He turned his attention in many directions and patented a sowing machine (for seeds) and a steam plough. In 1861 he patented his gun, which was of great service during the Amer. civil war, but was greatly improved in 1865. By means of a revolving handle a constant rifle fire was kept up from eight to ten rifle barrels which revolved on an axis.

Gatooma, one of the six municipalities of S. Rhodesia, is situated in the centre of a rich gold-mining area. It is the headquarters of the electrical supply commission and of the administration for the Hartley dist. Farming, cattle ranching, and pedigree cattle breeding are carried on, and a large cotton research station has been opened. The climatic conditions are specially suitable for maize, cotton, and tobacco growing. Pop. (white) 1500, (native) 4000.

Gatty, Margaret, see under EWING, JULIAN HORATIO.

Gatty, Nicholas Comyn (1874-1916), Eng. opera composer, b. at Bradfield, Sheffield, and educated at Downing College, Cambridge. Studied at the Royal College of Music (principally composition, with Sir Charles Stanford). For some years was organist at the Duke of York's Military School, Chelsea. Musical critic to the now defunct *Fall Mall Gazette*, 1907-14. His opera *Greysteel* was produced in Sheffield in 1906, and this was followed by *Duke or Devil* at Manchester in 1909. *The Tempest* was produced at the Surrey Theatre, London, in 1920, and *Prince Ferelon* (a Carnegie award) at the Old Vic in 1921. Other works: *Macbeth*, a tragic opera; *King Alfred and the Cakes*; and *Romance*, piano-forte waltzes.

Gatum, tn. in the Panama Canal zone, where part of the canal works are situated. G. lake, in the vicinity, has been converted into a reservoir by the construction of the G. dam. The dam is 1½ m. long and 1 m. wide at its broadest point.

Gau, see GA.

Gauchos, name given to the inhab. of the pampas of Argentina. They are chiefly of Sp.-Amer. origin, but the strain is tinged with Indian blood. Their

horsemanship is superb, and they are also exceedingly clever with the lasso. The habits of the people themselves are sordid. Gambling and profligacy are rife amongst the male portion of the inhab., whilst the women are treated very badly. They are, however, externally polite and hospitable.

Gau deamus, Lat. student song of very anct. origin. The name is derived from the first word of the song, 'Gau deamus igitur, juvenes dum sumus' ('Let us then rejoice while we are young'). It is still extremely popular in the student world, not only in Germany, but in Scotland also. A modified version of an adaptation dating from 1778 appears in *The Scottish Students' Song-book*.

Gauden, John (1605-62), supposed author of the *Eikon Basiliæ*. He was b. at Mayfield, Essex, a place of which his father was vicar. He received his education at Bury St. Edmunds and later at St. John's College, Cambridge. He became chaplain to Robert Rich, earl of Warwick, who was one of the parl. leaders. At first his sympathies were with the Parliament, but the excesses of the advanced parliamentarians drove him to change his opinion. He became bishop of Exeter after the Restoration, and later became bishop of Worcester. His claims to the authorship of the work already quoted are not absolutely definite, but have much to be said for them. The authorship was, and still is imputed by some to King Charles I. See E. Almack, *A Bibliography of the King's Book*, 1896.

Gaudens, Augustus Saint-, see SAINT-GAUDENS.

Gaugamela, vll. in Assyria, situated near the anct. site of Ninevah and near the modern tn. of Mosul. The battle which is usually called Arbela was fought near here, and the tn. from which it receives its name is in reality some 40 m. further E. At this battle Alexander the Great defeated the Persians under Darius III, 331 B.C.

Gauge, term applied to the width of a railway track. The G. is different in most countries, and depends upon the measurements adopted by most of the railways. The measurement is made from inside to inside of the head of the rails. The chief measurements for the princi. countries of the world are India, 1 metre; 3 ft. 6 in. in parts of Australia and S. Africa, Egypt, and the Sudan; 4 ft. 8½ in. in Great Britain; 6 ft. in U.S.A. Tramway G.s are usually 4 ft. 8½ in. Narrow G. lines are used for the sake of economy in preference to standard G., because the rolling stock is lighter and cheaper; more important is the fact that with the contraction of G. the engineer is able to sharpen his curvature, and thus, in rugged country, adapt his routes to the folds of the hillsides. High speeds, however, are not possible.

Gauging, art of measuring the amount of liquid in a receptacle, or the holding capacity of any vessel. In the wine, beer, and spirit trade special men are engaged to estimate the amount of stock in hand.

Gauguin, Paul (1848-1903), Fr. painter. An original artistic genius, influenced at

first by Cézanne and perhaps by van Gogh, with whom he worked at Arles. Spent his later years at Tahiti and elsewhere in the tropics, leaving many records on canvas of his life in 'a riot of light and vegetation, among a gentle people...'. Almost his whole life was a struggle against dire poverty, especially after he gave up a business career in Paris. He early married a handsome Dane, Mette Gad, whose ideals were very different, and whom he left with four children, and some paintings by more acceptable artists of the day which his wife was able to sell for about £400 in 1885. He continued to correspond with her, and evidently intended to return when he had earned enough to raise them above poverty. She and her relations are recorded to have had no faith in G.'s art, widely celebrated to-day. That art passed from impressionism to what G. called 'cloisonism,' an invention of his own. As an admirer remarked, G. 'indulged in colour combinations of unsurpassed liberty.' The roads were red, the fields violet, tree-trunks green, and foliage yellow; yet 'the ensemble gives one a feeling of truth' (Raymond Cogniat, 1947). His debt to the work of Cézanne can be exaggerated, and belongs chiefly to the earlier canvases (see G. Macke, P. Cézanne). Nor did G. care for the expositions of his supposed theories. 'If others have favoured me with a system,' he wrote in 1897, 'I have none; and don't want to be accused of that. Yet letters to his friend Montfroid, such as one eloquently describing his last important work—'D'où venons nous? Quo sommes nous? Où allons nous?'—show that he had a closely reasoned understanding of the product of his mind and hand. See also FRENCH ART. See lives by P. G. Rotondiamp, 1906; B. Becker, 1931; R. Burnett, 1938; and R. Cogniat, 1947; also *Lettres à D. de Montfroid*, ed. by V. Segalen, 1918, and *Letters to his Wife and Friends*, ed. by M. Malinguie, 1948.

Gauhati, or Gowhatty, tn. of Assam, India, standing on the Brahmaputra, 70 m. E. of Gauhati. It is the cap. of the Kamrup dist., and the largest tn. in Assam, and, until superseded by Shillong in 1874, was the centre of Brit. administration. It is still an important trading centre, and is remarkable for the number of ruined temples, etc., in its vicinity. The temple of Kamakhya is a Hindu place of pilgrimage. Pop. about 10,000.

Gaul, Gilbert William (1855-1919), Amer. painter; b. at Jersey City, New Jersey. Associate, National Academy of Design, 1880; academician, 1882. Painted 'Indian Girl' (1880) and 'Old Beau' (1881). Speciality, battle-pictures—especially scenes from civil war, e.g. 'Charging the Battery,' 'Saving the Colors,' 'Battery H in Action' (in the Toledo Museum), 'Silenced,' 'Exchange of Prisoners' (in Democratic Club, New York), and 'Guerillas returning from a Raid.' Later pictures: 'Golden Prospects' (1910); 'Ration Day,' and 'Peace Conference' (1912).

Gaul, see FRANCE.

Gaulle, Charles de (b. 1890). Fr. soldier, b. in Lille, Nov. 22. His father was a prof. of philosophy and Fr. literature at a well-known Catholic college in the rue de Vaugirard, Paris. In 1910, after winning honours in his general education at the Collège Stanislas, he entered the military academy of St. Cyr. At twenty-one he passed out as second lieutenant, and was given a commission in the 33rd Infantry Regiment. His commanding officer was



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GENERAL DE GAULLE

Pétain (q.v.), then a colonel. Became a company commander in Pétain's regiment during the First World War. Fought at Douaumont (q.v.), Verdun, and was captured by the Germans. After the armistice he served as a major under Weygand (q.v.) during the 1920-21 Bolshevik campaign in Poland. Then he returned to St. Cyr as prof. of military hist. His success led to his being sent to the École de Guerre, the Fr. staff college, where he became aide-de-camp to Pétain, the commander-in-chief. In 1927, in conformity with Fr. service policy, he was returned to active duty as a commander of a light infantry battalion. Two years later he was sent on a secret mission to Iraq, Persia, and Egypt. In 1932, as general secretary of the Committee of National Defence, he reached a post from which he could propound his theories on mechanisation. In 1937, after a short course at the centre for advanced training, he was given command of the 507th Regiment of Tanks, from which he rose, with the rank of colonel, to command the tank

brigade of the Fifth Lorraine Army. On May 15, 1940, the day before he was allowed to demonstrate his theories on the battlefield around Laon, he became brigadier-general in command of the 4th Armoured Div. He then tried to induce Pétain, Weygand, and Reynaud (Prime Minister) to allow him to defend the Marne, the Seine, or Paris. Reynaud finally consented to let him establish his defences around Bordeaux, and the seat of gov. was moved there. But he was now fighting virtually alone. The Fr. Gov. had decided to capitulate. He strove to steel Reynaud's courage to continue the fight in Africa, and flew to London to ask for the necessary shipping. His request was granted, but it was too late. Reynaud had resigned, and de G. realised that the only place to continue the struggle for France was from London. He founded there a Fr. National Committee, over which he presided, and himself assumed the title of leader of all Free Frenchmen, and began to organise a Fr. Army and Navy in Britain. He failed in an attempt to seize Dakar, but was successful in bringing the Chad and Fr. Equatorial Africa over to the Allies.

He was commander-in-chief of the Fighting Fr. Forces controlled by the National Committee until 1943, when he became president of the Committee for National Liberation. After the entry of the Allies into Paris he became head of the Fr. Provisional Gov. and chief of the armed forces. The elections of 1945 confirmed him as president of the gov., minister of national defence, and head of the armies. In 1948 he resigned on the pretext that his task was ended. He re-entered the political arena in 1947 as leader of the Rassemblement du Peuple Français, an organisation which, though contesting national and municipal elections, did not describe itself as a political party, but was rather a coalition of individuals and parties opposed alike to socialisation of property and anti-clericalism. It included many disident members of the Mouvement Républicain Populaire, the original Gaullist party, which, however, continued its separate existence (see also FRANCE, History). The political platform of the Rassemblement du Peuple Français contained as its only firm plank the personality of de G. presented as the only non-Communist leader able and willing to restore order and discipline. This emphasis on 'order,' combined with de G.'s frequent invocations of 'the glory of France,' could not fail to invite comparison with Boulanger (q.v.) and with authoritarian and paternalistic despots such as Piłsudsky, Franco, and Pétain.

His reputation as a professional soldier was enhanced by the pub. of *Very L'armée de métier* (1934), in which he advocated a small highly trained professional army more nearly approximating to the *Reichswehr* of von Seeckt than to the large conscript army, predominantly infantry, on which the military traditions of the Third Republic rested. He favoured the concentration of armoured troops in armoured

divs. as against the general staff policy of parcelling them out as army tank brigades in a supporting role, and his ideas on the tactical employment of armour were, ironically, most conclusively demonstrated by such commanders as Guderian in the Polish and Fr. campaigns of 1939 and 1940. His two most important military works are *Au fil de l'épée* (1932, Eng. trans. as *The Philosophy of Command*) and *Vers l'armée de métier* (1934, trans. as *The Army of the Future*). The latter is still regarded by some as the most important work on mechanised modern warfare. His predictions in this book were extraordinarily accurate, even to indicating the places where the Germans would break through the Fr. lines in the war that was to come. But the traditionalists, brought up on the tenets of Foch and Joffre, were against him, and none would listen to his revolutionary ideas. Besides the above he has pub. *La Discorde chez l'ennemi* (1921) and *La France et son armée* (1938, trans. into Eng. 1945). See Barres, *Charles de Gaulle*, 1912.

Gaunt, John of, see JOHN OF GAUNT.

Gauntlet (Fr. *gant*, a glove) was the name given to a steel glove forming part of the armour of knights. The back of the hand, on such gloves, was made of plates joined together in order to allow of the closing of the hand. The phrase 'to throw down the gauntlet' is a synonym for issuing a challenge. 'To run the gauntlet' is a punishment where the culprit runs between two rows of persons, each of whom strikes him as he passes. The use of the word *G.* hero is due to a mistaken derivation from *galloppe*-Swedish *yata*, street, and *lopt*, a course.

Gaur, see CUGR.

Gaur, species of bison found in most of the regions of India and Burma. The hill tribes have succeeded to a slight degree in domesticating it, but, on the whole, it is much more frequently found in the wild state. It is almost black in colour, and has high convex ridge between the horns. The ears are large, but the animal has no dewlap. Often the bull attains a height at the withers of 6 ft., but the back slopes very much, so that it is much lower at the loins. The animal is very shy and is usually found in large herds.

Gaur, anc. city of Bengal now in ruins. It is situated on the R. Bhagirathi. From 1100 until the decline of the Muslim power it was the residence of the viceroys and kings of Bengal. It is about 70 m. E.S.E. of Bhagalpur. See G. H. Raven-shaw, *Gaur: its Ruins and Inscriptions*, 1878.

Gauss, Karl Friedrich (1777-1855), Ger. mathematician. He was b. of humble parentage at Brunswick and quickly attracted attention by his ability. In 1801 he pub. *Disquisitiones arithmeticæ*. Six years later he became director of the Göttingen observatory, an office which he retained until his death. His work gave great impetus to astronomical observation and he did much work on the theory of magnetism. He erected an observatory free from iron from which he con-

tinued his researches on the subject of the magnetism of the earth, which had world-wide effects. He founded the Magnetic Association. The word 'gauss,' unit of magnetic flux density (hence 'degaussing,' in relation to the protection of ships' hulls against magnetic mines in the Second World War), is adopted from his name. Between the years 1863 and 1871 his works were pub. in 7 vols., and in 11 vols., 1870-1924.

Gautama, see BUDDHA AND BUDDHISM.

Gautier, Léon (1832-97), Fr. literary historian and palaeographer, b. at Le Havre. From 1893 chief of the historical section of the national archives. As prof. at the Ecole des Chartes he furthered research into the literature of the Middle Ages. His works include *Les Époques françaises* (1865-68, 1878-97) and *Histoire de la poésie liturgique au moyen âge* (1886).

Gautier, Théophile (1811-72), Fr. poet, critic, and novelist, one of the most famous personalities of the nineteenth century. He was b. at Tarbes in the Pyrenees, but came to Paris while still a child, and was educated at the Lycée Louis-le-Grand and at the Collège Charlemagne. With the intention of becoming a painter he entered de Roubt's studio, where he remained two years. But he was a great lover of poetry, and Sainte-Beuve had just made known to the modern world the romantic writers of the sixteenth century—the poets of the *Pérade*. The reading of these and of the writers of the new romantic school, especially Victor Hugo, raised G.'s enthusiasm to a high pitch. Pétrus Borel, struck with some verses he had written, introduced him to Victor Hugo, who found in G. something more than discipleship—a fervent fanaticism. Sainte-Beuve too was astonished by the work of this young writer, not yet eighteen, who already showed an almost unsurpassable gift of style, drawn very evidently from Marot, Ronarid, du Bellay, etc. whose tradition, abandoned by Malherbe and those who followed, he now, with the new poetic school, determined to carry triumphantly forward. He threw himself with extravagant fervour into the movement and became an extreme opponent of the classic school. His defiance of conventionality led him even into grotesqueness of personal appearance—a cherry-coloured waistcoat, green trousers, grey overcoat lined with green satin, a luxuriant forest of black hair—this was the 'get-up' which he triumphantly describes as 'pas mal combiné pour irriter et scandaliser les philistins.' And indeed 'shocking the philistines' became one of his prime motives, to the detriment later of some of his work. He became one of a band of 'brigands de la pensée' calling itself 'Jeune-France.' In 1832 he produced his first long poem, *Albertus*, an extravagant theological legend remarkable for its perfection of style, its colour and imagery. Then followed *Comédie de la mort* (1838); *Les Jeunes-France* (an attack upon the 'false romantics,' 1833); and *Mademoiselle de Maupin* (1835), a novel which shocked public opinion by the

contempt for morality displayed therein. At this point G. became a journalist and for thirty years his chief work was that of art critic and *feuilletoniste*. In *l'Amour et l'amitié* (1852) G.'s style reaches its climax of perfection; here is seen, fully realised, that 'science of form' which was his religion. In these exquisite little poems in verse of eight syllables, the words have what he held they should always have, like precious stones, a beauty and a value all their own. It might be said of him that he did not abandon the career of a painter, but that he merely changed his tools. This feature is most pronounced in his collection *L'Amour et l'amitié*, in which everything is regarded from the point of view of the painter. 'Le style, c'est l'homme' is true of G.—his subject interested him far less than the form in which he presented it. He was not inspired by great ideas, he was an artist with a supreme love of beauty and great power of humour, irony, and charm. His theory and credo of the supreme importance of form in art at the cost both of sentiment and ideas was the side of G.'s work which inspired those who were later known as the Parnassians. If this doctrine was essentially false and harmful in its influence, it certainly exerted a very wholesome influence on literature in liberating Romanticism from what was in danger of deteriorating into an over subtle and morbidly introspective sentimentalism. His *Menagerie intime* (1869) is an informal biography, full of grace and lightness of touch, in which his favourite cats figure daintily. His other works include *l'Ortensio* (1838), *Jellature, Une larme au diable* (1839), *Le Capitaine Iracasse* (1843), *Spirale* (1866), *Tristes Montes* (1848) and other travels, *Histoire de l'art dramatique en France* (6 vols.) (1872), and the posthumously pub. *Histoire du romantisme*. His daughter Judith (1846–1917), who he caused to write under her name of Judith Gautier, wrote novels in her name of Judith Gautier. See lives by D. Gay, 1857, H. Murger, 1862, Helen Pitch, 1922, R. Jasinski, 19... and A. Hot, 1913. See also H. van der Tuin, *l'Homme psychologique esthétique et littéraire de Théophile Gautier*, 1933.

Gautland, see GOTLAND

Gauze, light thin, transparent fabric used for dress purposes. The name is thought to have been derived from the fact that it was in Palestine where the place of its origin. The warp threads of the material are crossed between each thread of the weft, which passes through a succession of loops in the warp. It is the threads are kept apart, with no tendency to slide, and the transparent character of the fabric is maintained. Other materials have this gauze-like quality, such as muslin, etc. The manuf. is most extensively carried on in France and Switzerland.

Gavarni, Paul (1801–67). Fr. caricaturist. His real name was Hippolyte Guillaume Sulpice Chevallier. He was born at Paris and became a mechanical engineer, but he abandoned this profession and became caricaturist for *Le Charivari* and *Le Charivari*. His work gradually assumed a more serious tone and there

entered into his caricatures a slight bitterness. He visited London in 1849, out of which visit came his work in *L'Illustration*. He illustrated also a number of books published about this time, amongst which may be mentioned the works of Balzac, Sue's *Wandering Jew*, and the Fr. trans. of Hoffmann's tales. See E. and J. de Goncourt, *Gavarni, l'homme et l'œuvre*, 1873, H. Franche and O. Uzanne, *Dame et Gavarni*, 1906, and study by J. Robiquet (1912).

Gavazzi, Alessandro (1809–89), b. at Bologna, and became a Barnabite monk. He became prof. of rhetoric at Naples and allied himself with the Liberal policy of Pope Pius IX. He worked hard, with the papal sanction, amongst the people of Rome, and was appointed almoner-in-chief to the national army. After the fall of Rome G. separated from the church of Rome being after this date a strenuous advocate of the Italian Free Church (Protestant). He visited England and Scotland and lectured there, as he did also in U.S.A. and Canada, but his reception was the opposite of enthusiastic. He was associated with Garibaldi at Palermo serving him as chaplain in 1860.

Gavelkind. Tenure in G., which is only met with in Kent, is a species of socage tenure dating from the earliest days of the feudal system of land holdings. The distinguishing characteristic of lands held in G. is that they descend not to the eldest son but to all the sons together. It was abolished by the Law of Property Act, 1925 (see also COBARCINGS, and cf. BOUGHTON IN NORFOLK).

Gaveston, Piers (d. 1312), Earl of Cornwall, son of a knight of Gascony and the favourite of Edward II. He was the first brother of Prince Edward, and his great influence over Edward when he became king was the cause of much trouble at home. He was on one occasion made regent of England, but was finally banished. His return was the signal for an outbreak on the part of the barons, and he was captured at Scarborough by the earl of Pembroke and executed.

Gavle, or Gelle, a port of Sweden in the co. of Gästrikland, on the gulf of Bothnia at the mouth of the Gelle R., 93 m. N.W. of Stockholm. The town is situated on two islands as well as on the river-banks. It has a good harbour, there is an old castle and a fine town hall. The chief exports are iron goods, iron, timber, and wood pulp. It has shipbuilding yards and factories of machinery, tobacco, and cloth. Pop. 43,250. The co. or län has an area of 7600 sq. km. pop. 276,900.

Gavotte, name of a jig dance, said to be derived from the Gavots, the inhab. of the Pays de Gap. The music of the dance is in common time, beginning on the third beat of the bar. It is in two sections, each of which is repeated. The classical composers often introduced Gs. into their suites.

Gawain (Welsh, *Gwylm*), one of the knights of the Round Table, nephew of King Arthur and son of Lot, king of Norway and the Orkneys. About 1130 William of Malmesbury speaks of G.'s

tomb in Wales and says he was king of Galloway. Then Geoffrey of Monmouth made his name famous, relating many of his exploits and the story of his death fighting for Arthur. He is here a most courteous and virtuous knight, and Wace, in his trans., carries on this tradition and says that 'his worth was greater than he took credit for, and that he performed more than he promised.' In Chrétien de Troye's continuation of the Anglo-Norman tales G. is still a model of all the knightly virtues, and he is the hero of a great part of *Perceval*. In the *Tristan* and *Lancelot* of a later period the 'gay, gracious and gode' knight becomes cruel, treacherous, and 'light o' love.' Malory, deriving his material from this source, and Tennyson, following Malory, present G. in this light. Some writers identify G. with the Irish hero Cuchullin (q.v.), and trace to Ireland this undeserved change of reputation, ascribing it to misconception arising out of the fact that G., whom tradition made to be a knight 'out of faerie,' as Chaucer puts it, was the champion of women and came from that part of the anct. Irish 'other world' called the 'Isle of Women.' See Jessie L. Weston, *The Legend of Sir Gawain*, 1897, 1900; J. D. Bruce, *Evolution of Arthurian Romance to 1300*, 1923-24; and Columbia Univ. Press, *Celtic Myth and Arthurian Romance*, 1927.

Gay, Delphine, see under GIRARDIN, ÉMILE DE.

Gay, John (1685-1732), Eng. poet, b. at Barnstaple and educated at the grammar school there. He was apprenticed to a silk mercer in London, but having a strong taste for poetry and no aptitude for business, he was soon set free. Little is known of his life until 1713, except that in 1708 he pub. his first poem, *Wine*. From 1712 to 1714 he was secretary to the duchess of Monmouth. In 1713 he wrote *Rural Sports*, georgic, which he dedicated to Pope, whose famo was by this time estab. This brought him the patronage and life-long friendship of Pope, with introduction into the company of wits associated with him: Arbuthnot, Swift, Bolingbroke, and Congreve. These friendships stood him in good stead ever after; all loved and helped the happy, simple-hearted, improvident 'good fellow,' and mediocre poet who was always suffering from the 'large promise with performance scant' of aristocratic patrons. In 1714 he pub. *The Shepherd's Week*, a series of pastorals written at Pope's request to satirise the pastorals of Ambrose Phillips. He also pub. the poems *The Fan* (1714); *Trivia* (1716, written with Swift's help); *The Wife of Bath* (1713), an unsuccessful comedy; *The What d'ye Call It?* (1715), a dramatic skit; and *Three Hours after Marriage* (1717), a play which was a complete failure. His *Fables* (1727, 1738) are his best work; they are little masterpieces of their kind. But the work which made him famous was a lyrical drama, *The Beggar's Opera*, first produced by Rich in London in 1728 and afterwards performed throughout the Brit. Isles, making 'Gay rich and Rich gay.'

(see also LYRIC THEATRE). It is a satire on the corruptions of society. *Polly* (1729), its sequel, was prohibited, unacted. G. wrote sev. ballads; two of the best known are *Black-eyed Susan* and *'Twas when the Seas were Roaring*. He lost all his money and spent the later years of his life in the hoine of the duke and duchess of Queensberry. He was buried in Westminster Abbey. The *Poetical Works* have been ed. by G. C. Faber (1926). See E. Curll, *The Life of Mr. John Gay*, 1733; W. Cox, *The Life of John Gay*, 1797; W. M. Thackeray, *English Humorists of the Eighteenth Century*, 1853; L. Melville, *Life and Letters of John Gay*, 1921; F. W. Bateson, *English Comic Drama, 1700-1750*, 1929; and P. F. Gaye, *John Gay, His Place in the Eighteenth Century*, 1938.

Gaya, dist. and city of India, in the prov. of Bihar and Orissa, Bengal, and the Patna div. The city is 87 m. S. of Patna, and contains a high school, hospital, and printing presses (pop. 105,200). The dist. is 4712 sq. m. in area. Opium is the chief crop; mica mines are worked in the S.W. Other industries are the manuf. of brass utensils and black stone ware, the weaving of carpets and blankets, and the production of shellac. The grand trunk road traverses the S. and branches off the E. Indian Railway run to G. Pop. 2,755,300.

Gaval, or *Bos frontalis*, species of ox found in the highland regions of N.E. India. The animal is often found wild, but just as frequently in a semi-domesticated condition. Compared with the gaur (q.v.) it is a smaller animal, and its horns are much straighter. The forehead has no frontal crest. The G. and the gaur frequently interbred.

Gay-Lussac, Joseph Louis (1778-1850), a Fr. chemist and physicist, was b. at St. Leonard, Haute-Vienne. In 1797 he met Berthollet, who appointed him demonstrator to his class and assistant in the government works at Arcueil. In 1809 he was elected prof. of chem. at the École Polytechnique. In 1832 he was chosen prof. of general chem. at the Jardin des Plantes Paris. He is famous for his chemical and physical investigations. In 1804 he made a balloon ascent with Riot to ascertain whether the terrestrial magnetism ceased out of contact with the earth. In a second ascent he observed the regular decrease of pressure, temp., and moisture in the air. He also affirmed that the air has the same composition at the greatest height as at the surface of the earth. In 1804 and 1805 he made experiments with Humboldt and discovered that water is composed of oxygen and hydrogen in the ratio 1 : 2. He also made a study of other gases and pub. in 1808 his *Law of Volumes*. In 1811 with Thénard he discovered that potassium could be obtained by a purely chemical process. In 1813 he pub. some valuable information about iodine, and in 1824 he discovered and investigated fulminic acid, and also experimented in fermentation. He is also famous for his experiments regarding the

manuf. of sulphuric acid, glass, and chloride of lime. The more important of his papers are scattered through Jours., often difficult of access. The most complete list of them will be found in the catalogue of scientific papers of the Royal Society. Two of his most important works are *Recherches physico-chimiques faites sur la pile* (1811) and *Cours de physique* (1832). Accounts of some of his discoveries and views are to be found in J. Thomson's *History of Chemistry* (vol. II.), 1830; H. Kopp, *Entwickelung der Chemie*, 1871; J. B. Dumas, *Lecons sur la philosophie chimique*, 1878. See also P. Lenard, *Grosse Naturforscher*, 1929.

Gaza, Theodorus (1398-1478), Gk. teacher, b. at Thessalonica. Was teacher of Gk. at Ferrara, and afterwards prof. of philosophy in Rome. Later he was given a benefice in Calabria by Cardinal Bessarion. His most important work is one on Gk. grammar, pub. in 1495, and he also trans. Aristotle, St. Chrysostom, Theophrastus, and other writers.

Gaza, now called Guzzeh, was the most southerly of the five chief cities of the anc. Palestine. Situated about 3 m. from the sea, where the trade routes from Egypt and Petra met, G. was long an important fortress and trading tn. It is now cap. of the S. Prov. and is an airport. The prin. surviving monuments of G. are the orthodox church of St. Porphyry; the great mosque—Jami' al-Kebir—also originally a Christian church and restored after the damage suffered in an earthquake (1927); the Jami' al-Sayid Hashim, containing the tomb of Hashim; and the sanctuary of Abu al-'Azm ('father of strength'), with the reputed tomb of Samson. The Tel-el-Amarna tablets mention G. for the first time, and in biblical times it was the scene of many struggles between the Israelites and the Philistines owing to the fact that through the land of Peleshet the low-lying plain between Mt. Carmel and Egypt lay the only route practicable for armies between Egypt and Babylon. It was the Philistine tn. of which Samson carried away the gates (Judges xvi. 3). G. was famous under the Philistines for the worship of the fish-divinities Dagon and Derketo, who probably had Minoan affinities. Besides the main transit route from Egypt to Damascus an important route reached the sea at Gaza from the Yemen through the Hejaz; this, the frankincense route, was vital for G. because the immense demand for frankincense and myrrh could only be met in the one way, and when Alexander the Great took G. the booty included immense stores of frankincense in the city's warehouses. G. was then the largest city in Palestine and Syria. Although G.'s first traditional bishop was the Philemon to whom St. Paul addressed the epistle of that name, paganism continued almost up to the time of the Arab conquest. In 634 G. was occupied by the caliph 'Omar and became important to Muslims, partly because the prophet's grandfather Hashim (a direct ancestor of the Sherifian dynasty) is buried there, partly because it is the bp.

of Ibn Idris al-Shafi, the founder of the Shafi rite or school of Sunnite Islam. During the Crusades G. was bitterly contested between the Saracens and the crusaders, but suffered a terrible blow in 1244, when the Christians and Muslims, in alliance, were defeated by the Khwarizmians. Under Rom. rule G. had been prosperous, being then called Minon, but its power began to decline in later years, until it was of no account in the fourteenth century. In the sixteenth century the Mamelukes were finally defeated here by the Turks, and in 1799 it was taken by Bonaparte. Finally it was the scene of two battles (March 26-27, 1917) between the Brit. and the Turks in the First World War, and was very largely destroyed by the Turks and by subsequent bombardments. It was occupied by Gen. Allenby's troops on Nov. 7, 1917. Of late years the cultivation of barley has caused a partial return of prosperity. It was made an episcopal see by Constantine the Great, and has a mission with schools of the Church Missionary Society, including a hospital. Recent (1930-31) researches by the Brit. School of Egyptian Archaeology estab. that the obvious site of G. would be at the mouth of the Wady Guhzzeb, the estuary of which riv. is too marshy for permanent occupation. This site, the site of Tell-el-Ajjul, is practicable only in the rainy season, beginning Jan., and, according to Flinders Petrie, was occupied from the Neolithic to the Bronze Age, and appears to have been the old G. After the age of the Shepherd Kings, it was evidently abandoned like Ostia and the tk. cities of S. Italy. Pop. 29,300.



GAZELLE

Gazelle, or *Gazella*, genus of antelopes, the majority of which are inhab. of the deserts of the Old World. They have narrow upper molar teeth, like sheep, and their muzzles are covered with hair. There is frequently a gland below the eye and the tail is rather short. The horns are generally compressed and lyrate or

recurved, or cylindrical and spiral with distinct rings for a considerable portion of their length. The Gs. are amongst the most elegant of all antelopes and are characterised by their sandy colour and a white streak on the side of the face from the base of the horn nearly to the nose. The genus is represented in S. Africa by the springbok.

Gazetteer. In modern Eng. this term signifies an alphabetical arrangement of place-names, in other words, a geographical and topographical dictionary containing more or less abundant information, comprising statistics, descriptions, and historical details. In the eighteenth century the word was used in the sense of a writer in the gazettes or newspapers (Fr. *gazetier*), and in 1703 the *Gazettier's or Newsman's Interpreter* was pub. by Lawrence Echard, followed in 1704 by a second part, called *The Gazetteer*. Although expressed by a new word, the idea was of antc. date, and considerable fragments of the sixth-century geographical dictionary of Stephanus Byzantius remain to this day. Echard's method was soon adopted by other compilers, viz. Bryce, who pub. his *Grand Gazetteer* in 1759, and Crutwell, with his *Universal Gazetteer* 1908. More modern works have now superseded these, including Longman's (*Times*), Blackie & Chambers, Lippincot, Jack, Oliver & Boyd, etc. etc. Foreign general Gs. are represented by Ritter's *Geog. Statist. Lexikon* (1808) and *Le Nouveau Dictionnaire de géographie universelle* of Vivien de St. Martin, Cassell & Mackenzie (1893) for Great Britain; Lewis, Wilson & Brabner for England and Wales; F. H. Groome for Scotland; and Lewis & Leggatt for Ireland, come under the heading of special Gs. Among foreign Gs. may be mentioned Neumann for Germany, Hunter for India, Altavilla for Italy, Semenov for Russia, Rosenberg for Sweden, and Weber for Switzerland, as also a series of departmental Gs. for France. In India alone the Brit. Gov. bore the cost of the compilation of numerous Gs. for the different states. Hunter's *Imperial Gazetteer of India* is on a magnificent scale, and remarkable for its accuracy. The individual states of the Amer. Union also have special Gs.

Gazna, see *GHAZNI*.

Gdansk, see *DANZIG*.

Gdynia, seaport of Poland, 12 m. N.W. of Danzig. It was estab. in 1920 as a port of the Polish Corridor after the First World War, and at once became a serious rival to Danzig. It commands 70 m. of Polish coastline, and was rapidly modernised. A quarter of a century ago Gdingier, as it was called, was merely a Pomeranian fishing vil. of no significance to Europe, well sheltered from the Baltic by the long sandy Hel Peninsula, with splendid bathing beaches. But, in 1924, after it had changed its name to G., and its nationality from Ger. to Polish, Polish engineers had effected a great change. Channels were dredged and a new large breakwater constructed, and part of the new harbour had been carved from the land itself, while

new docks were built and new quays equipped. G. now had a water area of 790 ac. and an ann. capacity of 7,000,000 tons. Rivalry with Danzig was now so intense that the authorities of Danzig sought to obstruct any transfer of traffic to the new port. Through the League of Nations they argued that as Danzig had been created a free city in order to provide Poland with a port, Poland's use of G. destroyed the basis of this provision and therefore there remained no reason for the continued separation of Danzig from the Ger. Reich. The League refuted these contentions, particularly on the ground that experience had taught the Poles that they could not rely on the impartiality of Danzig in an emergency. Moreover in G. as nowhere else the creative tendencies of modern Poland found their outlet and the tn. could justly be described as a reflection of the merits and faults of the present-day Pole. With the Ger. militarisation of Danzig, however, G. became directly menaced. G. was occupied by the Gers. in 1939, but was taken by the Russians in 1945. Pop. 120,000. See further under POLISH CORRIDOR.

Ge, see *GMA*.

Gean, see *MAZZARD*.

Gear-cutting, process of cutting teeth from a blank disk, as distinct from casting in the gear-wheel in a mould.

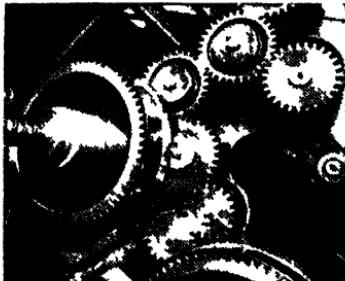
Gearing refers to the apparatus which communicates the energy from one part of a machine to another. It may consist of toothed wheels, endless bands, or of friction rollers, etc. A description of the various gears used will be found under the articles dealing with the various types of machinery. The relative velocity of wheels in gear is proportional to their diameters. Thus if two wheels with diameters of 60 and 20 in. respectively be geared up, then the relative velocity of the latter to the former will be as 3 is to 1. Expressed as a formula we might put it that if N and N_1 represent the number of turns in a given time, and D and D_1 the diameters of the wheels making the revolutions, then $\frac{N}{N_1} = \frac{D}{D_1}$. The number of wheels geared up together may, of course, be more than two; in which case the relative velocity is always considered as between the first and the last wheel in the series. The direction of motion of the last wheel will also obviously depend on the number of wheels in the system. Straight G., by means of spur wheels, generally, is used when the planes of motion are parallel. When the planes intersect, then bevelled G. by the aid of bevel wheels must be used. Further, if the planes neither intersect nor run parallel, i.e. are skew planes, then skew bevel wheels must be used, giving of course a skew bevelled G. The shape of the teeth on any wheel must be such that the friction caused by them, when in gear with another wheel, shall be as small as possible. The teeth are spaced, naturally, at equal distances apart, and this distance is known as the pitch. The pitch can be found by multiplying the diameter by π (roughly

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$3 \frac{1}{16}$ or $\frac{22}{7}$) and dividing by the number of teeth. Thus, Pitch - Diameter $\times \frac{22}{7}$.

The teeth of a wheel may be made in any curve provided that the perpendicular common to the outlines of the teeth in contact passes through the point where the pitch circles touch.

Among other types of G. that may be mentioned are Helical G., in which the pitch surfaces are cylindrical or



For ILLUSTRATION

STRAIGHT GEARING

conical, and the teeth intersect the surface in helical lines. This is a modification of tooth G., which enables the wheels to work more smoothly than in the ordinary G. and greatly strengthens the teeth for speed reducing, screw and worm G. may be used. In this the teeth of the wheel consist of portions of many screw threads. The worm which drives the wheel usually consists of from one to three complete threads. Thus for each revolution of a worm which has only one thread, the wheel would move just one tooth forward. So if the wheel had 100 teeth, then the worm would revolve 100 times to drive the wheel round once. A special form of G., known as Houldsworth's differential G., is used in spinning machinery for regulating the speed of bobbins. In reality it is only a special modification of bevelled G., consisting as it does of four equal bevel wheels mounted on axes to fit into each other. By an ingenious keying arrangement as the bobbins fall with thread the speed diminishes, so preserving a constant tension on the thread. Friction G., used in lifts and other places where a rapid connection is necessary, consists of rollers or wheels which are pressed together in the direction of the line joining their centres. Where a constant velocity ratio is desirable and when the pressure transmitted is great, pitch chain G. is used. This consists of a chain running in projections on sprocket wheels to minimise friction the pins forming the chain are provided with rollers. Various by the actions of these rollers have been important among which may be mentioned prophetous Reynold chains. Toothed ancestor & usually made of brass, cast iron, although sometimes in

high speed G. raw hide teeth are used, and occasionally wooden teeth are employed. The rollers in frictional G., on the other hand, although sometimes made of iron, usually have at least one with an acting surface of wood, leather, or compressed paper. See also under MOTOR CARS, MOTOCYCLES; MACHINERY. See W. Unwin, *Elements of Machine Design*, 1877; Sir A. Kennedy, *Mechanics of Machinery*, 1886; C. W. MacCord, *Kinematics*, 1901; and H. E. Merritt, *Gears*, 1944.

Gebel-al-Tarik, see GIBRALTAR

Geber, or Gebr, supposed author of certain works on alchemy and chom which are written in Arabic or Lat. So little is known of him that his existence has been doubted. He has frequently been identified with Jâbir ibn Hayyân, a famous Arabic alchemist who lived at Kufa and Bagdad in the eighth or ninth century. His bp has been given variously as Kufa, Tarsus, and Harran in Mesopotamia, and some have asserted his death to have taken place in 776. But the Lat. writings from internal evidence appear to have been written in the early part of the thirteenth century, and it has therefore been denied that a man of the name of G. ever lived. It is presumed that they were written by various hands. The chief writings which go under this name are *Summa perfectionis*, *Summa collectionis complementum secretorum naturae*, and *Liber investigationis*, which were trans into Ing. by Russell in 1678. Recent researches on the subject have led to the conclusion that the Arabic works ascribed to Jâbir ibn Hayyân must have been written about a century after the time of their supposed author. They are intimately connected with the doctrines of the Ismâ'îlî sect. The Lat. works are not worthy as the clearest and most important of medieval chemical treatise. See E. Darmstaeter, *Die Alchemie des Gebers*, 1922 and E. J. Holmyard, *The Arabic Works of Jâbir ibn Hayyân*, 1923.

Gebhardi, Johann Ludwig Levin (1679-1764), Cr. historian, b. at Brunswick. His most important pub is *Der Europäischen Kaiser- und Königlicher Hauser historische und genealogische Erbauung vollständig aufgeführt* (1730-31). He also wrote *Reges Francorum Merovingiorum documentorum autoritate asserti* (1736), and other works of a similar character.

Gebweiler, see GIBBWILLER

Gecko, name given to all lizards belonging to the family Geckotidae of the order Lacertilia, they are small in size, dull in colour, and the soft skin is covered with granular tubercles. Most of them have adhesive digits, which enable them to run along smooth, horizontal, or vertical surfaces with astonishing rapidity. Gs are found in nearly all hot climates, and in Egypt and India frequently enter houses, their name indicates the sound emitted by certain species. *Phyllodactylus* is the most widely distributed genus, *P. mauritanicus* being found in S Europe. The individuals of *Ptychozoon* are remarkable for the web-like expansions which serve them as parachutes.

Ged, William (1690-1749), inventor of stereotyping, b. at Edinburgh, where he worked as a goldsmith. He patented his invention in 1725, when he entered upon a partnership with a London stationer, Jenner, and a typefounder, Jamos. He stereotyped two prayer books for Cambridge Univ. (1731) and an ed. of Sallust (1744), but his enterprise was not successful. Consult a narrative by his daughter and a life by Nichols (1781).

Geddes, Sir Auckland Campbell, first Baron (b. 1879). Brit. prof. of anatomy and politician. His reputation rests on his organisation, during the First World War, of a scheme of national service. Prof. of anatomy at McGill Univ., Montreal, prior to the beginning of the First World War. In 1916 he was appointed director of recruiting, in 1917 chief of the national service ministry, in 1919 president of the board of trade, M.P. for Basingstoke and Andover from 1917 to 1920. Ambas. to U.S.A., 1920-24.

Geddes, Sir Eric Campbell (1875-1937). Brit. man of business and politician, b. in India, elder brother of Sir Auckland G. He went to America early in life to do railway engineering work. In 1906 he became general manager of the N.E. Railway Company and, in 1914 First World War, was appointed deputy director-general of munitions and, later, director-general of military railways. He then entered Parliament, and became successively controller of the navy, First Lord of the Admiralty, and minister of transport. In the post-war Coalition Gov. he was entrusted with 'the axe' to cut departmental expenditure. In 1922 he left politics to become chairman of Dnipro Rubber Company and of Imperial Airways.

Geddes, Jenny, Edinburgh woman who, on July 23, 1637, hurled her stool at the head of Laud's bishop as he was going from the desk of St. Giles' to read the collect for the day, exclaiming as she did so: 'Dell colic the wame o' thee, fause loon, would you say mass at my beg!'

Geddes, Sir Patrick (1854-1932). Brit. scientist and sociologist. Educated at the univs. of London, Paris, Edinburgh, and Montpellier; prof. of botany at Univ. College, Dundee. He wrote many important articles on biological and sociological subjects (including *Cities in Evolution*, 1913), and, with Sir J. Arthur Thomson, *Evolution of Sex* (1890). Held the chair of sociology and civics at Bonnay in 1919. He wrote *The Life and Work of Sir Jagadis C. Bose*, F.R.S. (1920).

Geesl, com. of Belgium in the prov. of, and 27 m. E. of, the city of Antwerp. It is known as a colony for the insane, as feeble-minded people have from earliest times been sent here to be under the control of, and employed by, the citizens. There is an infirmary for the temporary accommodation of those in need of medical assistance. The tn. has a trade in dairy produce, has tanneries, breweries, and dye-works, and manufs. of woollen goods, lace, and tobacco. Pop. 22,200.

Gee-laks, see GILYAKS.

Geelong, city in co. of Grant, on Corio Bay and Barwon R., Victoria, Australia.

Corio Bay has thirteen wharves, where ships of tonnage load and discharge; there are facilities for shipping wool and wheat to overseas markets, also large silos for bulk handling of wheat; connected by rail to all parts of the state. Industries include textile, cement, salt, rope and cordage, stoves, spirits, medicines, unbreakable glass, fertilizers, motor-cars, canneries, aerated waters, fibro-plaster and wool scouring works. The city contains a city hall, hospitals, orphanages, churchees of all denominations, free public libraries, art gallery, gov. tourist bureau, six colleges, textile college, technical and high schools, law courts, fire brigade stations, theatres, large wool stores, wool exchange, and large woollen mills. There are many sporting arenas—Kardinia Park Oval, main football and cricket ground, accommodates 30,000. Johnstone Park, adjoining the city hall, is beautifully laid out, and contains memorial art gallery, band stand, and peace memorial. Well planned botanical gardens overlook the bay and the modern shark-proof swimming enclosure and children's pool. Electric tram and also buses run to the suburbs and beach. Pop. (including suburbs) 55,000.

Geeraardsbergen (Grammont), tn. of E. Flanders, Belgium, with a fifteenth-century tn. hall. A traditional fête called *Krakelingen en Tonnekenbrand* (Crackers and Bonfires) is held on the first Sunday of Lent. Pop. 11,200.

Geer, Louis Gerhard, see DE GEER.

Geestemunde, see WESERMÜNDE.

Gegenbaur, Karl (1826-1903). Ger. comparative anatomist, b. at Würzburg, where he was educated. In 1855 he was appointed prof. of zoology and comparative anatomy at Jena, but after three years lecturing confined himself to the latter subject. From 1873 to 1901 he held a similar post at Heidelberg. He made his reputation chiefly on *Grundriss der vergleichenden Anatomie* (1874) (trans. into Eng. by F. Bell and E. Lankester, 1878). His publs. include *Lehrbuch der Anatomie des Menschen* (1883); *Vergleichende Anatomie der Wirbeltiere* (1898-1901); *Erlébtes und Erstreben* (1902); and a short autobiography (1901). He ed. the *Morphologisches Jahrbuch* from 1875.

Gehenna (Heb. *Ge Hinnom*, valley of Hinnom), word used by the later Jews to designate a place of torment for the wicked after death. The valley of Hinnom is a deep, narrow gorge, a few miles S.W. of Jerusalem, where some of the later kings of Judah practised the 'Abomination of the heathen' (cf. 2 Kings xvi. and xxiii.; Jeremiah vii.). When King Josiah re-established the national worship of Jehovah, it became the cesspool of Jerusalem, where the bodies of criminals were burnt. Hence it came to be used as a symbol for hell. In the N.T. there is a clearly marked distinction between the state of the dead (R.V., 'Hades') and the place of punishment (R.V., 'Gehenna').

Geibel, Emanuel von (1815-84). Ger. poet, b. at Lübeck. He graduated at Bonn (1838), travelled considerably in the Greco-Asiatic archipelago, and lived a quiet and studious life among literary friends in

various Ger. tns. In 1843 he received a royal pension, and in 1852 was appointed prof. of aesthetics at Munich by Maximilian II. of Bavaria. G. composed two tragedies, *Brunhild* (1858) and *Sophonisbe* (1868), and a comedy, *Meister Andre* (1865). His fame rests chiefly in his lyric poems, which won him great popularity. These were pub. in *Gedichte* (1840); *Juniuslieder* (1848); *Neue Gedichte* (1856); *Spätherbstblätter* (1877); and *Gedichte aus dem Nachlass* (pub. posthumously), 1896. He trans. poems from Sp. and Fr. classics, in collaboration with Ernst Curtius, Paul Heyse, and others, and also wrote trans. from the Grk. and Lat. poets. An ed. of his collected works appeared in 8 vols. in 1884. His correspondence with P. Heyse was ed. by E. Petzet (1922). His biography has been written by K. I. Goedekes (1869); C. Litzmann (1887); C. Leimbach (1894); K. T. Gaedertz (1897); and A. Kohut, 1915. See also M. D. Prodels, *E. Geibel und die Französische Lyrik*, 1905, and B. Pompeki, *Heine und Geibel*, 1901.

Geiger, Abraham (1810-74), Jewish theologist, b. at Frankfort-on-Main. In 1832 he became a rabbi in Wiesbaden. He subsequently officiated as rabbi at Breslau (1838-63), Frankfort (1863-70), and Berlin (1870-74). He assisted in starting the *Zeitschrift für Jüdische Theologie*, and from 1862 till his death he ed. the *Jüdische Zeitschrift*. His pubs. include *Urschrift und Übersetzungen der Bibel* (1857); *Sadduzar und Pharisee* (1863); and *Das Judentum und seine Geschichte* (1861-71). See life by L. Gelzer, 1910.

Geiger Counter, device for the detection and counting of fast electrified particles (e.g. from radioactive materials). The potential between two electrodes is just insufficient for a discharge to pass unless the gas between is ionized by the passage of a particle.

Geijer, Erik Gustaf (1783-1847), Swedish historian, b. at Ransäter, in Värmland. He was one of the founders of the Gothic Society (1816), was appointed a member of the academy (1824). His poetical works were of a high order and include *Sista Skalden, Vikingen, Skaldestycken* (1835); *Odalbonden*, etc. His chief historical works are *Srea Rikes Hafder* (1825), intended to be a complete hist. of Sweden from the earliest mythical times, but of which only the introductory vol. was completed; and *Svenska Folkkels Historia* (1832-36), a hist. of Sweden down to the abdication of Queen Christina in 1654. He ed. the papers of Gustavus III., which he left to the univ. of Upsala. His collected works were pub. in 10 vols. (1873-77) with a biographical sketch. See lives by B. Malmstroem, 1848; J. Neilsen, 1902; H. Borelius, 1909; and J. Landquist, 1921.

Geikie, Sir Archibald (1835-1924), Scottish geologist, b. at Edinburgh, where he was educated at the high school and univ. In 1855 he received an appointment on the Geological Survey, and in 1867 became director of the Geological Survey for Scotland. After having

lectured in geology at the Edinburgh Univ. 1870 to 1881 he was appointed director-general of the Geological Survey of the United Kingdom and head of the dept. of practical geology in the London Museum. He was knighted in 1891, and received the Order of Merit in 1911. His chief publs. are *The Story of a Boulder* (1858); *Scenery of Scotland* (1865); *Memoir of Sir R. Murchison* (1875); *Text book of Geology* (1882); *The Ancient Volcanoes of Great Britain* (1897); *The Founders of Geology* (1897); *Scottish Reminiscences* (1904); *Landscape in History* (1905); and Charles Darwin as Geologist (1909). His autobiography, *A Long Life's Work*, was pub. in 1921.

Geikie, James (1839-1915), Scottish geologist, brother of Sir Archibald G., also b. and educated in Edinburgh. He served on the Geological Survey of Scotland from 1861 to 1882, when he succeeded his brother as Murchison prof. of geology at Edinburgh. His writings include *The Great Ice Age in its Relation to the Antiquity of Man* (1874); *Historical Geology* (1875); *Prehistoric Europe* (1881); *Outlines of Geology* (1886); and *Structural and Field Geology* (1905). His literary sympathies are manifest in his excellent trans. of *Songs and Lyrics of Heine* (1897).

Geiler von Kaysersberg, Johannes (1445-1510), Ger. preacher, b. at Schaffhausen, and studied at Freiburg and Basel. He was a great pulpit orator and preached in the Strasburg Cathedral from 1478 till his death. His chief writings are *Das Narrenschiff* (1511); *Das Irrg Schaf* (1510); *Christliche Pilgerschaft zum Ewig'en Vaterland* (1512); and *Das Erangenbienbuch* (1515). An ed. of his *Schriften* was pub. at Freiburg (1877-83). See biographical studies by L. Achene, 1878; W. Lindemann, 1877; and E. Röder von Diersburg, 1921. See also C. Schmidt, *Histoire littéraire de l'Alsace du quinzième siècle*, 1879.

Geisha, Jap. dancing or singing girl. The G. usually learns to dance when a child of about seven, and is contracted by her parents to a master or mistress for a period of three years; frequently poverty-stricken parents sell their children outright to the owners of 'geisha houses.' The G. is kindly treated and beautifully dressed by her patrons, who arrange for her public appearances at restaurants and tea-rooms, and themselves receive the profits. The dancing is mainly posturing and is without rhythm. One or more of the Gs. depict a story in dance, while others play upon the *shamisen* and sing the theme of the story. But with the adoption of European forms of entertainment the institution is dying out.

Geislingen, in. of Württemberg-Baden, 17 m. N.W. of Ulm, with glass, iron, and metal works, and wood and ivory carving. Pop. 14,300.

Gela, ancient Gr. colony on the S. coast of Sicily, founded by Rhodians and Croats in 960 B.C. It rapidly grew in importance, and in 582 founded the colony of Agrigentum. The colony became very prosperous during the rule of Cleander (505), and when his brother,

Hippocrates, became tyrant the whole of N. Sicily came under its sway. Under Gelon Syracuse was taken. Eschylus was buried here in 456. The tn. was captured by the Carthaginians in 405, and was destroyed by Phalaris of Agrigentum in 280.

Gelasius I., pope (492-506), the successor of Felix III. He was a native of Africa, but the date of his birth is unknown. He was autocratic in his rule, sternly repressed Pelagianism, and removed the name of Acacius, bishop of Constantinople, from the diptycha. He succeeded in driving out the Manicheans from Rome. On his death he was canonised, Nov. 18 being set aside in the calendar as St. G.'s Day. Sev. of his letters are extant, and also a treatise on the Eutychians and Nestorians, *De duobus in Christo naturis adversus Eutychen et Nestorium. Liber Sacramentorum*, and *Decretum Gelasii de libris recipiendis et non recipiendis* have erroneously been ascribed to him, though he may have written parts of the former. The classical definition of the relation between church and state was made by G. at the end of the fifth century. According to him, in Christian society the spiritual and temporal powers are entrusted to two different orders, each deriving its authority from God. Each of these powers is supreme in its own sphere, and within its own sphere is independent of the other power. Yet the two authorities are not completely separate. Both seek and serve the welfare of the same men and women, living in the same society. The principle is that while each is supreme in its own sphere, each is subordinate in relation to the sphere of the other. In spiritual matters the civil ruler is subject to the bishop; in temporal matters the bishop is subject to the civil ruler. See study by K. W. Grzelak, 1922.

Gelasius II., pope (1118-19), formerly John of Gaeta. He succeeded Pascal II., but shortly after his election he was expelled from Rome by the Emperor Henry V., who set up an anti-pope, Gregory VIII. (Burdinus), with the help of the Normans. G. returned to Rome in July 1119, but was soon compelled to withdraw to France, where he d. in the monastery at Cluny.

Gelatine, substance derived from bone and cartilage by treatment with boiling water. It is allied to the proteins, and is yet different from them. It contains carbon, hydrogen, nitrogen, oxygen, and sulphur, is flavoratory, precipitated from solution by tannic acid, and readily undergoes putrefaction. The most characteristic property of G. is that of dissolving in water at high temps. and solidifying to a jelly on cooling. It is prepared mainly from bones, which are treated first to remove the fat, and then with hydrochloric acid to dissolve out mineral matter. The bones are then bleached with sulphur dioxide and finally extracted with water at a temp. of about 80° C. Impure G. is known as glue (q.r.), whilst the purest form is a fish-G. known as isinglass. G. is used for making soups and

jellies, in photography, for making substitutes for leather and ivory, and in many other ways.

Gelderland, prov. of the Netherlands, bounded on the S.E. by Germany, on the S.W. by the R. Maas, and on the N.W. by the Zuider Zee, with an area of about 1939 sq. m. The chief rive. of this prov. are the Rhine, Yssel, Maas, and Waal. The chief occupation of the people is agriculture, and in some parts the soil is fertile, producing wheat, fruit, and tobacco, while the manuf. of cotton goods and paper is also carried on. This prov. was originally part of the Holy Rom. Empire, but after many vicissitudes was at the beginning of the nineteenth century divided between Prussia and Holland. The cap. is Arnhem, which was the scene of a great battle in 1945 between Brit. airborne troops and the Germ. For details of the fighting in the battle of Arnhem and at Nijmegen see WESTERN FRONT IN SECOND WORLD WAR. Pop. 1,019,700.

Gélee, or **Gelée**, Claude, see CLAUDE.

Gelimer, king of the Vandals (530-34), was the great-grandson of Genseric. He was successful in deposing Hilderic in 530 and in obtaining the throne for himself. He was, however, defeated in 533 at the battle of Carthage, and his kingdom overthrown, he himself retiring to Galatia.

Gellert, Christian Fürchtegott (1715-69), poet, b. at Hainichen in Saxony. In 1751 he became a prof. at Leipzig, where he had been educated. His works are important as marking the dawn of a new era in Ger. literature, as they broke away from the formalities of earlier writers and prepared the way for Goethe and Schiller. His writings, particularly his fables, were popular even outside his own country. He wrote *Fabeln und Erzählungen* (1748-1751) and *Tagebuch aus dem Jahre 1761* (1883). His works were ed. by J. L. Klee (1839) and F. Behrend (1910). See J. W. von Goethe, *Dichtung und Wahrheit* (vi.-viii.), 1811-22 (trans. 1897), and K. May, *Das Weltbild in Gellerts Dichtung*, 1928; and lives by J. A. Cramer, 1744; H. Döring 1833; H. O. Nietschmann, 1901; and F. Fleischhauer, 1923.

Gellert, Prince Llewellyn's dog, who was left one day in charge of the prince's child and was successful in killing a wolf who came to attack it. When Llewellyn returned and saw the blood he imagined that G. had slain his child, and immediately killed the dog. He then discovered his mistake when he found the child quite safe and lying under the cradle. A tomb stands to the dog's memory at Beddgelert near Snowdon. See W. R. Spencer, *Gellert's Grave*, 1850 (1); W. A. Clouston, *Popular Tales and Fictions*, 1887; and D. E. Jenkins, *Beddgelert, Facts and Folklore*, 1898.

Gellingar, urb. par. near Cardiff, Wales. Excavations carried out in 1900-1 yielded further information on Roman forts in Britain.

Gellius, Aulus, see AULUS GELLIUS.

Gellivara, see GALLIVARE.

Gelnhausen, tn. of Hesse, Germany. It stands on the Kinzig to the N.E. of Frankfurt, and on an is. in this riv. may be seen

the ruins of a castle built in the twelfth century by Frederick Barbarossa Pop about 4800

Gelon, tyrant of Gela and Syracuse. He came of a noble family of Gela, of which city he became master in 491 B.C. as successor to Hippocrates. In 485 B.C. he became master of Syracuse and took with him to that city many of the inhabitants of Gela and Camarina. He refused help to the Greeks when Xerxes warred against them and gained a victory over the Carthaginians at Himera in 480 B.C. He died about 478 B.C. beloved by all his people.

Gelsenkirchen, city of Westphalia, Germany, about 5 m. N.E. of Essen. It is in the most important coal mining district of the West; halan Ithine land industrial zone, and is on the Ems and Rhine-Heine canal. There are large iron and steel works and glass and chemical in-

form. An essential property of a G. stone is a high degree of hardness, so that it may stand the abrasion to which it is subjected at the hands of the jeweller in order to render it an article of personal decoration. The more precious stones, such as the diamond, ruby, emerald, etc., possess this quality, in particular the first named, which is the hardest G. in existence. These rare and more costly precious stones are seldom, if ever, treated by engraving, their high value resting on their brilliance of sparkle and colour and lustre. Most G. stones are harder than quartz, though a few such as the opal, moonstone, and turquoise are inferior to it in hardness; but the degree of hardness of a precious stone is soon ascertained by the lapidary when cutting it.

Gravels and other deposits of a similar nature frequently contain G. stones, where



ANCIENT ROMAN RINGS SET WITH GEM STONES

dustries. Synthetic oil plants were established there in preparation for the Second World War. It was so repeatedly and heavily bombed by the R.A.F. in 1940 that the G.G.M. made efforts to transfer its factories to Germany or Poland. It was finally overrun by the W. Allies in the spring of 1945 (see further under WESTERN FRONT IN SECOND WORLD WAR). The neighbouring town of Buer was incorporated in G. in 1929. Pop. 332,500.

Gem (Lat. *gemma*, 'a bud' from the root *gen* meaning 'to produce,' or 'precious stone'). Strictly speaking, the word G. is applicable only to such hard and precious stones as have been worked by engraving, but this is in its narrowest sense, and the word is applied to precious stones that have been cut and polished as jewels such as the diamond, emerald, ruby, sapphire, etc., and it is sometimes extended even to include the pearl. The stones of the G. engraver are almost entirely confined to the variously coloured and striped varieties of chalcedony and quartz. The best stone, usually known as onyx, is the chief material employed for cameo and seal engraving, and other stones, important from the G.-engraver's point of view, are jasper, agate, chalcedony, banded stone, etc. The ancient Egyptians seem to have developed the art of G. engraving and abundant remains of seals of high antiquity have come down to us. The scarabaeus, or sacred beetle, was the form in which their early seals were cut, with the intaglio design engraved in a flat base, and the early Gks. and Etruscans followed this

they occur as crystals, or fragments of crystals, which have been reduced in many instances to the form of pebbles. The great majority of precious stones occur in a crystallised form, which form, however, is soon destroyed in cutting. Amongst the few ornamental stones which occur without crystalline form may be mentioned opal, turquoise, and amber. Although some stones, notably diamonds, are valued for their lack of colour (diamonds, or pure 'water'), in most this is the prime element of attraction, and the beauty of many G.s depends entirely upon their colour, which however, is often due to the presence of pigmentary matter, and is not an essential property of the mineral. Tourmalines and sapphires, for instance, are often parti-coloured. The most common mineral pigments are probably compounds of iron, manganese, and copper. Exposure to light makes some stones change or lose their colour altogether; certain kinds of turquoise and topaz are particularly liable to this. Artificial light also makes some stones appear to change colour, as typified in sapphires and amethysts, which frequently acquire an inky, milky tint when displayed in artificial light. A cut stone depends largely on the amount of light reflected from its facets for brilliancy, the light being reflected back or refracted from the facets at the back. The highest refractive power of any G.-stone is possessed by the diamond. The peculiar lustre and fiery flashes exhibited by this stone are due to its high refractive index and dispersion. G.-stones present variety

in chemical composition. The diamond is composed of one element only; ruby and sapphire are oxides; turquoise is a phosphate, and so on. In ant. times stones were held in esteem for their supposed medicinal and magical powers as much as for their beauty and rarity. For example, up to comparatively recent times the toadstone was worn for its occult power, and stones such as jade are often valued for a similar reason at the present day. Uncivilised peoples value small stones, especially those of a peculiar shape and colour, as amulets or charms. Many of the superstitions regarding stones have come down to us, and the belief in 'lucky' stones is prevalent even nowadays.

A considerable trade has been carried on in modern times in the making of artificial Gs. for jewellery purposes, and paste copies of existing Gs. are manufactured with comparatively little difficulty. The most famous maker of paste was James Tassie, a Scot, who settled in London in the latter half of the eighteenth century, and was successful in copying over 15,000 of the most famous and artistic Gs. of both ant. and modern times. He also produced a series of portraits in cameo, wh. . . in great request at the present day and command quite high prices. Imitation stones are chiefly produced from a heavy glass lead of high refractive power, and they are easily coloured by the addition of various metallic oxides.

Attempts to make diamonds artificially have been numerous within recent years, but with the sole exception of those of Henri Morisca, all have resulted in failure. The artificial diamonds manufactured have not been larger than microscopic specimens; but in lustre, crystalline form, density, and hardness they are identical with the natural stone. Artificially made but genuine rubies and sapphires have also been put on the market. They have been obtained by heating barium fluoride with aluminium, in the presence of a trace of potassium bichromate in the case of rubies; and of cobalt oxide in that of sapphires. These synthetic Gs. are thus composed of the same elements as the natural rubies and sapphires, but experts in the trade can detect them readily by means of tests which would not occur to the layman, e.g. under a strong microscope round air-bubbles can be detected in the manufactured Gs., while, when present in natural stones, they are irregular in shape. A great many of these Gs. are made to-day in France, Germany, and Czechoslovakia to meet the demand for less expensive jewellery. They were produced as early as 1904 by the Fr. chemist Verneuil in his laboratory. Artificial pearls are made by inserting an irritant in the oyster-shell, and thus 'blister pearls' are produced. The cutting and polishing of Gs. is a difficult and delicate operation, and one requiring much skill on the part of the worker, especially when dealing with large stones, which may possibly be of great value. Small diamonds are often treated in what is known as 'rose' cut, that is,

the upper surface is shaped to triangular facets of nearly equal size throughout. Stones that are too thin to be cut as brilliants are often treated in this way.

See J. Wodisjaks, *Book of Precious Stones*, 1909; Sir A. H. Church, *Precious Stones, considered in their Scientific and Artistic Relations*, 1913; H. B. Bridgman, *Gems*, 1916; F. B. Wade, *Diamonds*, 1916; and *Text-book of Precious Stones*, 1918; G. F. H. Smith, *Gem Stones*, 1923; C. W. Cooper, *Precious Stones of the Bible*, 1924; E. B. Kraus and E. F. Holden, *Gems and Gem Materials*, 1925; H. B. Walters, *Catalogue of the Engraved Gems in the British Museum*, 1926; M. Weinstein, *Precious and Semi-Precious Stones* 1930; and G. F. Herbert-Smith *Gems and their Distinctive Characters*, 1912, 1949.

Gemblioux, tn. in the prov. of Namur, Belgium, 24 m. S.E. of Brussels. It was here that Don John of Austria defeated the army under Antony de Goignies in 1578. Pop. 4900.

Gemini (Lat. 'twins'), constellation and third sign of the zodiac. The sun enters this constellation at about March 20. This constellation derives its name from two bright stars in close proximity, α Geminorum (of the first magnitude) and β Geminorum (of the second magnitude), known respectively from the time of classic antiquity as Castor and Pollux (q.v.). The feet of the twins are crossed by the Milky Way, and the constellation contains a fine star cluster, M 35. There are two or three notable double stars in G., notably α and β Geminorum, and a nova was photographically discovered on March 16, 1903, by Prof. Turner at Oxford.

Geminiani, Francesco (1680-1762), It. violinist and musical composer, b. at Lucca. He studied music under Scarlatti and Corelli, following the latter very closely. In 1714 he visited England, where he very quickly became famous. A few years later he went to Dublin, where he devoted his time to music, and later on returned to London, where he d. It is said of grief, owing to the loss of a MS. He is the composer of many concertos and sonatas.

Gemistus Plethon Georgius (c. 1355-1450), Grk. Platonic philosopher, b. at Constantinople. Founded a sect on the principles of Neoplatonism. His treatises on Plato and Aristotle and on Zoroaster were pub. posthumously. Works printed in J. P. Migne's *Patrologia Graeca*, cxx. (1866). See W. Gass, *Gennadius und Plethon*, 1911, H. F. Tozer's article on Plethon in the *Journal of Hellenic Studies*, vii., 1886; and A. Riekel, *Die Philosophie der Renaissance*, 1925.

Gemmi Pass, mt. pass which crosses the Alps in Switzerland. It rises to a height of 7641 ft., and connects the canton of Valais with that of Bern. Near it, on either side, are the tns. Leukerbad and Kandersteg.

Gemsbok, or *Oryx gazella*, species of antelope which inhabits the desert regions of S.W. Africa. It stands about 4 ft. in height, and its general colour is greyish. The horns of the male animal measure

42 in. in length, while those of the female may reach 46 or 47 in.

Gem State, see IDABO.

Gendarmes, originally a cavalry regiment of France, and up to the time of Louis XVI. served as the king's body-guard. After the Fr. Revolution their functions were necessarily altered, and they are now a military police, consisting of infantry and cavalry. They are a part of the army, although they are better paid than the rest of the army, and may be called out on active service if needed. They have various duties, among them those of policemen. In Palestine, after the First World War, the Brit. Gov. organised a Jewish and an Arab gendarmerie to keep the peace.

Gender, distinction made in grammar between words to indicate a difference of sex in the objects denoted by those words. As a general rule in the Eng. language this grammatical distinction agrees with the natural distinction known as sex. Thus names denoting the male sex are masculine G., those denoting the female sex feminine G., and those denoting inanimate objects are neuter G., that is, neither masculine nor feminine. These are cases of natural G., that is to say, the sex and G. agree. This rule is departed from, however, sometimes when inanimate things are personified, as when a ship or engine is made feminine, and the sun and time are made masculine. These are cases of grammatical G. sex and G. being different. In O.E., and also in Lat., Ger., and Gk., this grammatical G. is much more common, many inanimate objects being either masculine or feminine G., while in modern Fr. and other romance languages the neuter G. does not exist.

Gene, the theoretical unit of heredity (q.v.), as demonstrated by J. G. Mendel's experiments in the breeding of plants, 1865. See T. H. Morgan, *Theory of the Gene*, 1926.

Genealogy, word of Gk. derivation, denoting family. It is the science by means of which the descent or pedigree of a family may be ascertained. Though perhaps hardly of sufficient importance to rank as an independent science, it forms a very important part of hist., and there is a growing interest shown in matters pertaining to genealogical research. G. has formed the basis of all true hist. from the earliest times, and many of the old Gs. have arisen from the desire to explain the origin of the various groups included by them. The first Gk. records were those of ancestry, and a wide scope for G. was afforded by the progress of civilisation in states, and, more particularly, by the institution of corporations and guilds in tns. In modern times the laws of inheritance and the desire to assert the privileges of an hereditary aristocracy have combined to give G. its importance; more especially those laws of inheritance governing the descent of real estate. It is long, however, before Gs. are found in the possession of private families and scarcely one, though very distinguished, can trace its ancestors even to the middle of the eleventh century. Only after the close of the Middle Ages did Gs. multiply in

men's houses and become collected in vols., but from the sixteenth century onwards they are found in plenty in MSS. and printed vols. Antiquaries have, for some centuries, made G. a favourite study, and their researches have been of the utmost value to the historian and biographer. A host of works are occupied with the G. of Eng. noble families, at the head of which stands Dugdale's great works on the Eng. language. Genealogical research has made great advance during the last generation, and its study at the present time is growing rapidly, not only in England, but in the U.S.A., and, to a certain extent, in Germany. Much genealogical material has become available by the pub. of par. registers, marriage licence allegations, and such-like; and particularly the mass of evidence contained in the vols. issued by the Public Record Office. See H. F. Waters, *Genealogical Cleanings*, 1901; D. G. Jordan and S. J. Kimball, *Our Family Tree*, 1929; J. H. Round, *Family Origins*, 1930.

Genée, Adeline (Genee-Isitt) (b. 1878), Dan. *'première danseuse*, b. at Aarhus, Jutland. A pupil of M. and Mme Alexander Genée; made first appearance as prima-dancer at Opera House, Copenhagen, 1895; *'première danseuse* Royal Opera, Munich, at eighteen. First appearance in Empire Theatre, Leicester Square, Nov. 1897, in *Monte Carlo*. Left Empire Nov. 22, 1907. Retired from stage in 1914, but reappeared for charity sev. times during the First World War. At Alhambra, Leicester Square, Jan. 1916. President, Association of Operatic Dancing of Great Britain, March 1928. In 1916 London Univ. conferred on her the honorary degree of doctor of music.

General: 1. Title of a. officer in the Brit. Army who holds the rank next below a field-marshal. There are also other ranks bearing the title G., such as lieutenant-general and major-general, both of which are ranks below G. In some other armies there is a lower rank, brigadier-general. 2. In the Rom. Catholic Church the title is popularly given to the head of certain religious orders under the pope. To the G. all the members of the order and all the officials are responsible, and he holds office as a rule for three years, though in the case of the Jesuits it is for life. The G. is only responsible to the pope himself, and is accorded certain privileges in Rome, where he usually resides. 3. The highest official of the Salvation Army.

General Assembly, highest eccles. court in the Presbyterian Church of Scotland, Ireland, and the U.S.A. In the G. A. of the Estab. Church of Scotland sit representatives from each presbytery, from the univs., and from the royal burghs. This assembly meets every year in May, and sits for about ten days as a general rule. It contains both laymen (elders) and clergymen, and has judicial and legislative power, and cases brought from lower courts are settled in this one. It is also connected with the state, as a lord high commissioner always attends to represent the king. In the other Presbyterian

churches the G. As. are very similar, the only difference being in their constitution and in certain unimportant particulars.

Generalisation, term in logic and philosophy denoting the inclusion or grouping under one general head of a number of individual objects or persons, ignoring all incidental differences and minor qualities and considering them solely from the point of view of their common characteristics. In logic the genus is a higher class including the lower class or species. Hence it follows that the wider a G. is the less specific it becomes.

Generalissimo, title given to a man who is commander-in-chief of sov. armies having under him other commanders, or of sev. divs. of the one army acting separately. This name is only used on the continent of Europe.

General Paralysis, or **General Paresis**, consists in a gradual loss of power of mind and body. It mainly attacks adult males between the ages of thirty and fifty. The onset may be aggravated by monotonous mental occupation, anxiety, or mental strain, and often becomes more apparent after injury, but the primary cause in many cases is syphilis. It affects the face and speech, muscular movement, and the condition of the eyes.

Fision.—The condition of the pupils is often one of the first symptoms to be noticed; they show diminished response to bright light, though still contracting when the eyes converge on a near object (Argyle Robertson pupils).

Muscular power.—The gait becomes irregular, often resembling that of a drunken man, and in a late stage the muscles are so seriously affected that the patient is bedridden. The difficulty is particularly noticeable when the patient tries to walk, or even stand, in the dark, and when the eyes are shut. The speech becomes thick and indistinct, especially when pronouncing long words and complicated sentences, and a peculiar convulsive tremor affects the upper lip if there is the least excitement. The handwriting is also affected. The face becomes dull and apathetic, or absolutely fatuous. The mental affections are often amongst the first symptoms, and always occur sooner or later. Patients become grandiose, and imagine themselves to be much richer or cleverer than they are, with consequent extravagance of ideas and expenditure of money. This is one of the most fatal and incurable forms of paralysis and mental affection, as recovery is of very rare occurrence. The course of the disease is apt to be prolonged, lasting from one to two, or even to ten or twenty, years. A prolonged course of anti-syphilitic treatment is indicated, until the Wassermann reaction becomes negative. Good results have also been obtained by raising the patient's temp., for a period, either by hot-air baths or by inoculating him with malaria.

General Staff, body of officers who direct the general training of the various armcs, collect and distribute intelligence, prepare schemes of attack and defence, and are charged with maintaining the army in the highest state of general efficiency.

General Steam Navigation Company Ltd., shipping line which owes its origin to a group of steam packetts which in 1820 plied between London and Margate. The company was founded under its present name in 1824. In 1842, when steamships had been greatly improved, Queen Victoria journeyed in the G.S.N.C. vessel *Trident* from Scotland to London. In 1902 the company became a limited liability company, and in 1909 it occupied the offices at 15 Trinity Square, London, where it is housed to-day. Between the two world wars offices were reopened or estab. in Germany, Holland, Belgium, France, and Italy. During the two world wars nearly all the company's vessels were engaged on war services, and many were lost. To-day the company maintains regular cargo services between the United Kingdom and most of the near continental ports, and also to the Mediterranean. It also operates, during the summer months, the well-known 'Eagle Steamers' which carry out day excursions from Tower Pier to Southend, Margate, Ramsgate, Clacton, etc. The company is part of the P. & O. group. In 1949 the company owned about fifty sea-going vessels, with a total gross registered tonnage of about 50,000 tons. See L. Cope Cornford, *Century of Sea Trading, 1824-1924*, pub. on the occasion of the centenary of the company, 1924.

General Strike (1926), see **STRIKE, GENERAL** (1926).

Generations, Alteration of, see **ALTERATION OF GENERATIONS**.

Genesis (Heb. *bereshith*), opening word, the first book in the Pentateuch (the Torah).

Contents.—This tells of the creation of the world and of man; the full offering of the first sacrifices; the genealogies of the lines of Cain and Seth; the flood; the blessing of Noah, the div. of the races of mankind, etc. G. is really an introduction leading up to the legislative portions of the Pentateuch, gradually becoming more detailed until the descent into Egypt. It is occupied with the hist. of the Patriarchs from the calling of Abraham—in fact about four-fifths of the book is taken up with this—and more than half with Jacob and his family.

Sources.—Although the supply of the material for the construction of the book may have been largely drawn from myth (parable) and legend (tradition), it must not be forgotten that writing was practised by regular scribes long before the call of Abraham, and records on tablets of clay may have been in existence, giving an account of the events. We must either call upon the imagination or revelation for the account of the creation, and unless we deny the possibility of the latter we must regard it as psychologically the most probable.

Date.—Without assuming that Moses was the author, we find that many of the events of G. were well known to the earlier prophets, and the book may have been compiled during the literary activity of the schools of prophets in the days of

Samuel. While, however, everything points to a gradual process of editing, the exact time cannot be determined.

Authenticity.—While parable and tradition may have been freely used, we must not forget that the destruction of the records of the Hyksos kings of Egypt by the dynasties that succeeded them renders the want of all reference to the hist. of Joseph of little probative force, and, all things considered, the odds against Abraham and his allies at Damascus (a common objection) were hardly greater than those against the Gks. at Marathon. The order observed in the G. story of Creation need not be regarded as the actual chronological order of the creation of things.

Genet, Jeanne Louise Henriette, see CAMPAN.

Genet, see GENETTE.

Genetics is concerned with the origin of individuals, varieties, and species, and with the causes of similarities and differences between individuals and their ancestors. The term G. was suggested in 1906 by Bateson, who did much to establish and forward the study of the science by his careful observations and experimental work in connection with the breeding of plants and animals (see BREEDING and BOTANY).

G. is intimately connected with the study of heredity (see HEREDITY and BIOLOGY) and with cytology (see CELL), for its great problems are those of the ways in which offspring inherit certain characteristics and yet at the same time have individual differences. How these arise, how resemblances are contained in the egg, manifest themselves at various stages during development, and are again passed on to generations of descendants, are problems for the geneticist to solve. The elucidation of certain problems arising in the study of groups of individuals has been made possible by biometric methods. The science of G., which owes much to T. H. Morgan and his collaborators, reached its culmination in 1934, when the cytologist, Painter, of the univ. of Texas, proved by ocular demonstration that the genes are in fact arranged in linear order along string-like chromosomes, as had long been surmised by geneticists on theoretical grounds as a result of their experiments in hybridisation. The manner in which the genes are passed on by the chromosomes is complex, but our understanding of it is remarkably accurate and complete. The main facts—the Mendelian ‘ratios’ (see MENDELI and MENDELISM), or proportions in which various kinds of offspring are produced, in all their complex variety—are as firmly based as any of the facts of biology. Results of research in G. have been successfully applied to eugenics, to scientific breeding, and to the study of evolution. It may be mentioned here that the study of G. (as the word is understood in the W. world) is forbidden throughout the Soviet Union, because one Lysenko recently denied the validity of the whole of G. and of the chromosome theory of heredity. In the early days of the Soviet regime G. was pursued as a matter of course, but

later the authorities explained to scientists that it was not their function to investigate mankind, but solely to serve the material wants of mankind. This meant that scientific research would eventually be directed by politicians through their chosen scientists, one of whom was Lysenko. Lysenko, partly by reintroducing some old agric. practises as if they were his own discoveries and by using the language of dialectical materialism, so imposed upon the Soviet authorities that finally they handed over the control of biological research to him—despite his dismissal of the science of G.

See W. Bateson, *Problems of Genetics*, 1913; W. E. Castle, *Genetics and Eugenics*, 1916; E. B. Babcock and R. Clansen, *Evolution in Relation to Agriculture*, 1918; F. A. Crew, *Animal Genetics*, 1925; T. Dobzhansky, *Genetics and the Origin of Species*, 1941; H. Kalmus, *Genetics*, 1948; and H. Riley, *Genetics and Cytogenetics*, 1948.

Genette (Arabic *jarneit*), or **Genet**, name given to a genus of carnivorous mammals belonging to the Viverridae; they are allied to the civet, but differ in being smaller and in the comparative faintness of their musk-like odour. Their fur is soft and often beautifully marked, the general colour being grey. They range over the S. of Europe, Syria, and Africa. *G. vulgaris*, the common G., runs wild in France and Spain, and is sometimes domesticated and trained to kill rats and mice.

Geneva (Fr. *Genève*; Ger. *Genf*): 1. Canton in the S.W. of Switzerland, bounded by the lake of the same name, the canton of Vaud, and France. The Rhone and numerous int. streams water the country, which is hilly; but the soil has been made fertile by persistent cultivation. The chief industries are fruit-growing and the manuf. of articles of jewellery and clocks and watches. G. was admitted into the Swiss Confederation in 1815. Area 109 sq. m. Pop. 174,800.

2. City in Switzerland, cap. of the canton of the same name. It is of great antiquity and is mentioned in Caesar's *Commentaries*. It acknowledged Roman supremacy in 120 B.C. In 458 it came under Burgundian sway, and was incorporated with the kingdom of the Franks in 534. G. is one of the most conspicuous places in Europe, owing to the celebrated part it has played in European civilisation as the centre of Calvinism. Calvin went to G. in the year 1536, and by his work there made it one of the chief religious centres throughout Europe. Since the end of the eighteenth century it has become the centre of a remarkable scientific activity. It is famous as having given birth to Rousseau, De Saussure, De Luc, and many other celebrated men, and its educational institutions and scientific collections are deservedly noted. Prior to 1847 G. was surrounded by walls, and its streets were narrow and ill drained; but after that year the town was entirely rebuilt in modern style. Its monuments are of no very

great magnificence, though it has some antique and picturesque buildings, and a fine statue of Rousseau is erected in its public pleasure grounds. It is also beautifully situated, the course of the Rhone through the town forming two islands. The principal edifices are the cathedral of St. Peter, the academy founded by Calvin and now converted into a university, the fine theatre, ranking next in size to the Paris Opera House, the Athénée and several museums.

tions it in his *Nouvelle Héloïse*, and Byron in *Childe Harold* and *The Prisoner of Chillon*. Mont Blanc, though 60 m distant, is visible from the lake, and is often reflected in its waters. At the upper end of the lake the Rhone enters it turbid and yellow, but at the town of Gex it is limpid and azure tinted. It has many historic and resorts on its shores which attract both tourists and winter residents —Vevey, Montreux, Coppet, Ferney, etc.



Swiss Federal Railways

GENEVA, WITH ROUSSEAU ISLAND
The snow covered peak on the left is Mont Blanc

notably the Museum of Natural History containing De Saussure's geological collections. An institute of higher international studies was founded in 1927. It was chosen as the seat of the League of Nations, for which a magnificent new palace was built, following the choice of designs, after an international competition held in 1927. The main block is in Ariana Park on the heights above Prévessin. Mr Rockfeller's gift of 2,000,000 dollars for the library enabled the city to replan its promenades and parks. The former building was bought back by the Swiss Govt for 4,000,000 francs (Swiss). Its chief industry is the manufacture of watches, clocks, jewellery, and musical boxes. In which articles it carries on a considerable retail trade. Diamond cutting and enamelling are also carried on to some extent. Pop. 124,000.

3. The lake of G. is situated between Switzerland and France, the larger portion belonging to the former country. It is in the form of a crescent and is 45 m long and 9½ m broad; its total area being 22 sq m. At certain periods of the year the surface of the lake is subject to sudden rises and falls, probably due to differences of barometric pressure on different parts. These phenomena are known as *seiches*. Mirages are also at times observed on the lake. The S. Fr. shore has the Savoy Mts. in the background, and is of a solemn and stern character while the shore on the side of the Pays de Vaud has become quite a classic spot on account of its association with men of note. J. J. Rousseau men-

dwelt there, and Byron in his *Childe Harold* and *The Prisoner of Chillon*. Mont Blanc, though 60 m distant, is visible from the lake, and is often reflected in its waters. At the upper end of the lake the Rhone enters it turbid and yellow, but at the town of Gex it is limpid and azure tinted. It has many historic and resorts on its shores which attract both tourists and winter residents —Vevey, Montreux, Coppet, Ferney, etc.

4. City of Ontario Co. New York, U.S.A., situated on the N. shore of Lake Seneca. It is the seat of the State Agricultural Experiment Station and of Hobart College (Protestant Episcopal) which was opened in 1822, also the William Smith College and the Smith Observatory. G. was settled about 1797 near the site of an Indian village and chartered in 1896. Gen Lafayette held a reception here in 1825. There are large nurseries, and manufacs. of motors, engines, optical instruments, cameras, etc. Pop. 15,500.

Geneva Conferences (Naval Disarmament). Conference of 1927, the sequel to the Washington Conference of 1922 (q.v.). Like the latter it was initiated by the U.S.A. It met at Geneva in 1927 for the purpose of closing the gap left by the Washington Treaty, which dealt only with capital ships and aircraft carriers. The problem of cruisers, destroyers, and submarines, however, remained unsolved. Furthermore, the prospects of the genera-

Conference were clouded at the outset by the refusal of France and Italy to send delegates on the ground that naval disarmament could not be discussed in isolation. Great Britain and the U.S.A. found themselves divided by an unbridgeable gulf: parity in tonnage, which was accepted by both, was not necessarily parity in fighting strength. Great Britain argued that her imperial interests required a large number of medium and small cruisers. Amer. interests demanded a relatively small number of large and heavily armed cruisers. To this demand Great Britain refused assent, and the conference broke down. Its sequel was the London Conference in 1930 (*q.v.*). See G. Engely, *The Politics of Naval Disarmament*, 1932.

2. Conference of 1932. After the London Conference of 1930 Britain and the U.S.A., both of whom had reduced their land forces to little more than token size, were concerned to find some way of reducing the world burden of armaments, and the unrest to which it gave rise. The chief impediment was France's unwillingness to reduce her armies without full guarantees of security; and the question was by this time further complicated by Germany's growing insistence on equality of rights in the matter of armaments. These were the factors which wrecked the Disarmament Conference that opened at Geneva in 1932. At this conference Britain and America advocated the restriction or elimination of offensive weapons, but could not agree as to what weapons came under that description. An Amer. proposal that all armaments should forthwith be reduced by one-third proved unacceptable. When the Ger. delegation angrily withdrew from the conference Britain was able to secure their return by inducing France to yield a grudging assent to Ger. equality in principle; but a Brit. proposal which tried to express this in exact figures was never accepted, and the conference was given its death-blow in Oct. 1933 when Hitler announced Germany's withdrawal not only from the conference, but from the League of Nations as well. See *Disarmament: a Review of the Acts of the League of Nations and of Governments of Deliberation and the Trend of Public Opinion and Action relating to the World Disarmament Conference of 1932* (Disarmament Committee, Geneva), 1932.

Geneva Convention. This convention or treaty was originally adopted at a national conference held at Geneva, Switzerland, in 1864, but was afterwards replaced by the convention of July 6, 1906, also adopted at Geneva. It was an international agreement, chiefly respecting the succour of the wounded in time of war, and it forbade all cruel methods of warfare. It was signed by twelve delegates from various countries, and later received the adherence of every civilised power excepting the U.S.A. In 1970-71, during the Franco-Ger. war, it formed a Red Cross Society, which was very prominent and helpful, the Geneva cross flag adapted from the insignia of the old

military Order of St. John being recognised as neutral. International conferences pronouncing the same objects were also held at Paris and Berlin. The adoption of the new (G. C. of July 1906 resulted in a new ed. being adopted at the Peace Conference of 1907. The last G. C. (Oct. 1907) consists of thirty three articles, under the following nine divisions: (1) wounded and sick, (2) medical units and estabs., (3) personnel, (4) material, (5) convoys of evacuation, (6) the distinctive emblem, (7) application and carrying out of the convention, (8) prevention of abuses and infractions, (9) general provisions. The principles of the G. C. were, by the Hague Convention of 1899, extended to naval warfare. See J. B. Scott (ed.), *The Hague Conventions and Declarations of 1899 and 1907*, 1918, and A. R. Werner, *La Croix-Rouge et les Conventions de Genève*, 1913.

Geneva Protocol (1924), or protocol for pacific settlement of international disputes, represents an attempt by the League of Nations to find a solution of the ambiguities and vagueness of the Covenant of the League (see COVENANT OF THE LEAGUE OF NATIONS). It was adopted by the fifth assembly of the League, and though it was rejected by the govt. concerned, it is of historical importance in that it reveals in clear relief the salient problems concerning Europe in the post-war period. In the protocol the League sought to tighten up the sanctions (i.e. penalties) against aggressive wars, and also to increase the number of occasions on which those sanctions should become applicable; and these reforms involved a determined attack on the problem of disarmament. But the Brit. representatives at the Council of the League would agree to nothing which should compel them to state in advance their country's quota contributions to the military, naval, and air forces (necessary to ensure the fulfilment of the obligations of the Covenant), nor surrender the right to determine for themselves those contributions. Thus, though the protocol added nothing to the legal sanctions (of Article 16 of the Covenant), it raised the moral obligations imposed on League members. In its next aspect the protocol, in a proposed amendment of Article 12 of the Covenant, ruled out absolutely the legality of war except when the nation in question was, in self-defence, resisting an act of aggression, or when it was acting on behalf of the League against a recalcitrant state. The test of aggression in the protocol was the refusal to submit a dispute to the procedure of pacific settlement provided by Articles 13 and 16 of the Covenant as amplified by the protocol, or, in other words, a party to a dispute would not only have to refer to one or another form of arbitration, but be compelled to comply with the judicial sentence or arbitral award which resulted therefrom. From the Brit. point of view, however, the fundamental weakness of the protocol was that the Brit. Parliament was asked, in effect, to surrender to what might be a group of unknown men in no way

responsible to it those powers of peace and war which it had claimed to exercise for centuries, and that is why Great Britain refused to ratify the protocol. See D. Hunter Miller, *The Geneva Protocol*, 1925; G. Butler, *A Handbook of the League of Nations*, 1925; and P. J. N. Baker, *The Geneva Protocol for the Pacific Settlement of International Disputes*, 1925.

Geneviève (or Geneva), Saint (c. 422-512), patron saint of Paris. According to tradition she was b. at Nanterre, then went to Paris, where she became famous for her benevolence and for her predictions of the future. Her festival is celebrated on Jan. 3, and relics connected with her are preserved at the church of St. Etienne du Mont. The great frescoes of Puvis de Chavannes in the Panthéon in Paris illustrate her life works.

Geneviève of Brabant, an eighth-century saint and heroine of medieval legend. Said to have been the wife of the palatine Siegfried, she was falsely accused of adultery and condemned to death, the punishment being commuted to exposure in a forest. The story goes that she wandered Diana-wise for some years when she was found by Siegfried during one of his hunting expeditions, and her innocence acknowledged. She is honoured as a Rom. Catholic saint.

Genghis (or Jenghiz) Khan (1162-1227), Mongol emperor; the son of Yewukal, his mother's name being Yulun. He was b. by the R. Onun, and was only thirteen when his father d. His name was Temuchin, which he changed in 1206 to Jenghiz, in Chinese 'Cheng-sze' (perfect warrior). His victory over the Nahman Mongols left him undisputed ruler in Mongolia, and after crushing the Merkit Khan on the R. Irtysh, he moved towards N. China, then occupied by the Kin Tatars. By 1213 three of his armies were sweeping from victory to victory, wiping out cities till the whole country N. of the Yellow R. was in his hands, except Yenking (Peking). G. moved back to the W. and crushed the Khitans and the Shah of Khwarizm (Khiva), whose ter. on the Oxus was the key to the Caspian and so to Europe. G. or his sons then in turn conquered Bokhara, Samarkand, and Merv, sacking and destroying the tns. and putting all the inhab. to death. His powerful rival, Mohammed of Khwarizm, d., and G. pursued his son, Jelaleddin, to Herat and thence to India. Meanwhile other armed had invaded Russia with the same astonishing success, and when G. d., in 1227, on a journey in Mongolia, his empire stretched from the Yellow Sea to the Dnieper. See Sir R. K. Douglas, *Life of Jenghiz Khan*, 1877; H. Lamb, *Genghis Khan, the Emperor of all Men*, 1933; and R. Fox, *Genghis Khan*, 1937.

Genit, see JINN.

Genista, genus of hardy leguminous shrubs found in the old world and represented in Britain by three species. *G. tinctoria*, the dyer's green-weed, found in Brit. fields, pastures, and thickets, is noted for the yellow colour obtained from its flowers and used in dyeing wool. The seeds act as a mild purgative. *G. pilosa*

is rare and local. *G. anglica*, a spinous plant, is common in England and Scotland. Altogether at least seventy species are known. *G. virgata* and *G. cinerea* are tall brooms growing up to 12 ft. high with small pointed leaves, silvery underneath, covering themselves with cascades of fragrant little pea-flowers of brilliant yellow in late June and early July. The chief difference is that the first-named flowers a little earlier. The honey-scented white blossom of *Plagianthus Lyallii* now flourishes under the name *Hoberia glabrata*. These are all S. plants from Madeira and S.W. Europe, but are reasonably hardy and can stand a limy soil. Dwarf kinds are useful for the rockery. *G. Hispanica* is a particularly useful kind in pots. The *Planta genista* was the badge of the Plantagenet kings.

Genius. In ant. Rom. mythology, each individual, at birth, is endowed with or has allotted to him a special protecting, guarding spirit, influencing his character and with whom rests the power of good or ill fortune, happiness, and misery. As the spirit, from birth, presides over the generating principle (Lat. *genius* is from root *gen-*, *gignere*, to beget), the G. is masculine; the women looked to her Juno, especially Juno Lucina, the guardian and protectress of women in childbirth. Though not a household god, offerings and sacrifices were made to the G. of the father of the family (*paterfamilias*), and the marriage bed is named *genitalis*, and dedicated to the spirit. It is by his G. that a Rom. swore. The Gk. *dæmon* is sometimes taken as a parallel, but the idea of evil or good *dæmones* was purely Gk., and the G. is peculiarly Rom., or, rather, It. When the early Rom. religion became influenced by the pantheon of the Gks., and a more personal view of the various deities came into vogue, they, too, had *genii* designed to them, and the custom spread of having a G. of cities, of trades, and guilds, and especially of the people or nation itself; thus, there was a *genius publicus populi Romani* as well as a *genius urbis*, i.e. of Rome. The personal G. of the emperors was publicly worshipped. Eng. has taken the word 'genii,' generally altered to 'genie,' as a trans., usefully representing the pronunciation of the Arabic *djin* or *jinn*, the beneficent or maleficent spirits of their folk-lore and mythology.

Genk, tn. in the prov. of Limbourg, Belgium, 5 m. E.N.E. of Hasselt. There are important coal-mines at the hamlets Waterschel, Zwartberg, and Winterslag. In 1920 the first coal of the Kempen (Campine) basin was mined here. Brewing and the manuf. of fibre are carried on. Asparagus is largely cultivated in its sandy soil. Pop. 33,800.

Genilis, Stéphanie Félicité, Comtesse de (1746-1830), Fr. writer, b. at Champsecret, near Autun. In 1770 she became lady-in-waiting to the duchess of Chartres, and was made governess to her daughters, and in 1781 the duke appointed her as tutor (*gouverneur*) to his sons, and despite the scandal and the resignation of the other tutors, she carried on their education

until 1793, when she had to leave France. After the Restoration she wrote in defence of monarchy and of religion. When she was past eighty years of age she wrote her memoirs. She lived to see the events of July 1830, and her former pupil raised to the throne. She d. on Dec. 31, aged eighty-four. Her methods of education seem to have been considerably in advance of her time, and we hear of her illustrating her hist. lessons by magic-lantern slides, and teaching botany while out for walks. Her works are numerous and of some historical value; they include *Théâtre de l'éducation* (1779-80); *Addéle et Théodore* (comedies for children, 1782); *Mémoires inédits sur le dix-huitième siècle* (1825); and a romance entitled *Mademoiselle de Clermont* (1802). See M. de Chabreul, *Gouverneur de princes 1737-1830*, 1900; L. Chabaud, *Mesdames de Maintenon, de Génie, et Campan*, 1901; G. Maugras, *L'Idylle d'un gouverneur*, 1904; and study by J. Harmand, 1912.

Gennadius II., or George the Scholar (c. 1400-70), Gk. patriarch of Constantinople. It is uncertain whether he is the 'Scholarius' that accompanied the Emperor John Paleologus to Florence in an effort to unite the churches of E. and W., and afterwards became a monk in Constantinople, and an opponent of union. After the capture of Constantinople by the Turks (1453) G. was made patriarch by Sultan Mohammed II. After four or five years he retired. An Aristotelean, he wrote much. He d. in the monastery of St. John the Baptist near Serrae, Macedonia.

Gennaro, San, see JANUARIUS'S SR.

Gennesaret, Sea of, see under GALILEE.

Genoa 1. Prov. of Italy, situated between the N. Apennines and the gulf of Genoa. It embraces the coast of the Riviera, and contains some of the most beautiful as well as the best cultivated and richest districts of the country. It has an excellent climate, and fruit abounds there. It covers an area of 1582 sq. m.; pop. 975,700, consisting chiefly of seafaring folk. 2. (It. *Genova*), city of Italy, situated on the gulf of the same name. It is a large maritime and commercial town, and a very important seaport. The city is surrounded by a wide extent of country, and presents an enchanting view from the water as it rises towards the summit of verdant and richly cultivated hills. It has some fine streets, though some of its thoroughfares are very narrow and ill lighted, and it contains many grand palaces and churches. Of the former, the most famous are the ducal palace, formerly inhabited by the doges but now used for meetings of the Senate; and the Doria, the residence of the celebrated Andrea Doria during his presidency of the republic, and presented by him in 1522. Several others also are of great interest on account of their architectural beauty, magnificent interiors, and historical fame, and many of them contain galleries of paintings with works of Van Dyck, Rubens, Albrecht Dürer, etc. The most noteworthy churches are S. Maria di Carrignano, of great architectural beauty; Ss. Annun-

ziata, and S. Lorenzo, the cathedral, built in 1100, a grand old pile in the It. Gothic style, which has been restored at frequent intervals. A number of these buildings were damaged or destroyed in the Second World War (see below).

The commerce of G. is widespread and important, and its manufs. considerable. Household furniture, cabinets, silks, velvets, laces, and coral and silver filigree work are manufactured on a wide scale, and have a noted reputation. The chief industrial estabs. of the city are ironworks, cotton and cloth mills, tanneries, paper factories, etc. The Genoese are skillful and hardy seamen, and shipbuilding has long been a noted activity. G. is the nearest port for Switzerland and for southern Germany since the important improvements in railway connection in the construction of the St. Gotthard railway, which increased its commercial prosperity. An outer harbour was constructed before the Second World War, with another basin for coal vessels, and a still further extension was completed subsequently. The minimum depth of the harbour is 30 ft., and the largest ships can enter. It has two dry docks, a graving dock, and a floating dry dock. Industry developed enormously before the war; armoured cruisers both for the It. Navy and for foreign govs. were constructed in the Ansaldo yards (see below), also merchant and passenger steamers in the Odero yards. The four main railway lines which centre on G. have all been electrified. The schools of G. are numerous, and the univ., founded in 1471, has faculties in law, medicine, science, engineering, and philosophy. A library, observatory, and physical and natural history museum are attached to it. Its charitable institutions are said to be the finest of their kind in Italy, including hospitals of various kinds and asylums for the poor. The chief focus of traffic and the centre of the Genoese tramway system is the Piazza Ferrari, which is a large irregular space embellished with a fine equestrian statue of Garibaldi, unveiled in 1893. The Via Roma is another important centre of traffic leading to the Piazza Corvetto, where stands the colossal equestrian statue of Victor Emmanuel II. G. was at one time occupied by the Gks. It came into the possession of Rome at the close of the third century B.C. After the fall of Rome it passed eventually into the hands of the Franks, finally, in the tenth century, asserting its independence and developing into a powerful republic. Long rivalry between the republics of G. and Venice terminated in favour of the latter. The republic came to an end with the outbreak of the Fr. Revolution and became part of the Ligurian Republic. In 1815 it was united with the kingdom of Sardinia.

G. was the scene of an unsuccessful world economic conference in 1922, at which twenty-nine countries were represented, among them for the first time Soviet Russia and the nations defeated in 1918, excepting Turkey.

In the Second World War the port was

bombarded by British warships on Feb 8, 1942, widespread damage being done to the docks and industrial estates. Oil tanks, marshalling yards, and merchant ships also were hit and large fires caused in the Ansaldo electric and boiler works, the main power station and dry docks round the inner harbour. The Fifth (Allied) Army occupied G on April 27 (1945) after partisans had seized part of the city. Considerable and widespread damage was sustained from the air raids

are among the many churches which suffered more or less serious damage, particularly S. Maria del Servi. The portion of the ducal palace occupied by the Procura del Re and the Tribunale were destroyed together with the central block. The sixteenth century portion of the imperial palace, the roof of the Palazzo Spinola and most of the Lamberti Doria Palazzo were destroyed. In the Palazzo Doria del Principe a Fassolo the fountain of Neptune by Giulio Carbone



GENOA

The two upper photographs show the damage to the harbor area.

directed against the harbour and communications. More than fifty churches, a dozen oratories, 130 palaces and villas and over a score of other buildings of less artistic importance in the city were damaged, though generally speaking the total losses amongst the monuments on the "protected list" were fewer than might have been feared. The most serious and irreparable losses were the splendid interiors of the medieval palazzi. The buildings destroyed beyond the city include the churches of S. Giacomo o Talao, S. Maria in Pizzorno and Converti and S. Pietro alla Locha, the oratories della Morte e Misericordia, Regini, Lucia, a Mirassi and di S. Martino, the archiepiscopal palace, the Gavotti palace and the Pagano-Solin palace, and the Teatro del Falcone in Palazzo Reale and the Teatro Pagani. The damage to the cathedral was not severe but the Bianchi Cavallina statue was destroyed. The church of S. Annunziata sustained considerable damage, part of the nave, six chapels and frescoes by Carivoli and Chissone being destroyed. S. Maria del Servi, S. Maria Assunta di Carignano, S. Pietro in Bianchi, S. Matteo, and S. Croce Camillo

was shattered and the finely decorated interior of the choir was seriously damaged. A great part of the Palazzo Cattaneo was ruined, frescoes by Andrea and Ottavio Semino in the Palazzo, polluting the central aisle of the gallery of the Palazzo Fosso frescoes by Tavarone in the Palazzo Lascaris. Bombed various parts of the interior of the Palazzo Andrea Doria and the roofs of the Palazzo dell' Università were also severely damaged. Among the ville which were most seriously hit were the Brignole Sale, Marcellini, Cantusso, Ruggi and de Keruul. The naval bombardment in Feb 1942 destroyed many seventeenth and eighteenth century paintings by Tavella and the Scuola degli Strozzi in the Sala delle Direzioni when the Oreno Gallico was struck. The Civica Berio and Missione librariai respectively 65 000 and 30 000 vols. 10 000 vols. were lost by the library of the Economico and Commercial Institute and many by the juridical faculty of the university. Pop. 613 300. See L. Doniver, *La storia della repubblica di Genova 1913*, T. S. Mills *The Genoese Conference, 1922*, and M. Sibona *Genova 1925*.

Genoa, Gulf of. This is the name generally given to the Mediterranean N. of Corsica, where the coast of Italy retreats with a curve. It receives numerous small rvs., the chief inlet being the gulf of Spezia, on which is situated the city of Genoa.

Genovela, Saint, see GENEVIEVE.

Genovesi, Antonio (1712-69). It. writer on philosophy and political economy, b. at Castiglione. He started his career as an ecclesiastic, but very soon abandoned theology in favour of the law, which in turn was also given up for philosophy. In 1754, one of his patrons, Bartolomeo Interi, a Florentine, founded the first It. or European chair of political economy on condition that G. was made first prof. His works include *Elementa Metaphysicae* (1743, et seq.); *Lopica* (1745); and *Lezioni di Commercio*, the first complete It. work on economics. See G. M. Monti, *J. Genovesi e G. H. Galanti*, 1926.

Genre Painting takes for its subject the familiar scenes of everyday life while 'historical painting,' in contradistinction to which the term has come to be used, takes great events.

Gens, historical and ethnological use, a tribe or clan, or any group of primitive people forming a distinct branch of a race. The term was especially applied to a clan or house in ant. Rome which included a number of families bearing the same name and descended from a common ancestor, and also sharing certain legal privileges and obligations, and also religious rites. Originally these *gentes* were exclusively patrician, but later they included plebeians. The name of the *gens* to which a Rom. belonged was indicated always by the middle of the three names which it was customary for a Rom. to possess.

Genserlo, or Galseric (428-477), king of the Vandals, b. about 390, and was the son of King Godigisel. He succeeded his brother Geoderic. He at once invaded Africa from Spain, besieged the Rom. general Bonifacius in Hippo, and conquered the prov. with much pillage and slaughter. In 455 he invaded Italy, sacked Rome, and brought back Eudoxia, the empress, captive. Majoranus, the Rom. emperor, in 460, and Leo I., the E. emperor, in 468, failed in their attempts at vengeance, and G. conquered Sicily, Sardinia, and the Balearic Isles. As an Arian he was a cruel persecutor of orthodox Christians. He was short and lame, but he long remained the great warrior king of the Vandals.

Gentbruge, tn. in the prov. of E. Flanders, Belgium, forming an E. suburb of Ghent. It has manufs. of textiles, paper, nails, and rubber. There is a central workshop of the Belgian railways. Market gardens and flower nurseries surround the tn. Pop. 17,700.

Gentiana, cosmopolitan genus of plants. Supposed to have been named after King Gentius of Illyria, who is said to have discovered their medicinal qualities. The gentians grow chiefly in Alpine regions, and are noted for the brilliancy of colouring in their flowers, and their intense bitterness, which makes them of great

medicinal value. *G. lutea* is a perennial bearing yellow flowers, and is frequently cultivated; it is the species most used in medicine. Native Brit. species include *G. Amarella*, *G. campestris*, *G. verna*, and *G. Pneumonanthe*.

Gentianaceæ, natural order of dicotyledonous plants cosmopolitan in distribution. It contains between seven and eight hundred herbs and shrubs, famed for their bitterness and the bright yellow, red, or blue of the flowers. The inflorescence is cymose, and the flowers are hermaphrodite; there are typically five united sepals and petals, five epipetalous stamens, two united carpels to form a superior ovary with numerous ovules; the fruit is a capsule or berry. Two of the chief genera are *Gentiana* and *Menyanthes*.

Gentile da Fabriano, see FABRIANO.

Gentile, Giovanni (1875-1944) It. philosopher, b. at Castelvetrano, Sicily, son of Giovanni G. Educated at the univ. of Palermo. In 1918 he became prof. of the hist. of philosophy in the univ. of Rome. He was made senator the same year. In 1920 he founded the *Giornale critico della filosofia italiana*. He was in the Fascist ranks from the first, and became minister of education when Fascism captured the gov. Also Fascist minister of science and arts; president of the Academy of Sciences and Arts, Florence. His philosophy, which he implemented in his ministerial work, is a transcending of that of Croce, being even more lyrical and objectless in its professions. It is, in practice, the philosophy of Fascism, with its roots in Vico, who believed in a something corporate, not composed of our individual selves, that makes for national glory. With Croce, precedent and idea have some controlling force; with G., apparently none—the dominant will is sufficient reason. Shot by partisans in the streets in 1944. See E. Chiochetti, *La filosofia di Giovanni Gentile*, 1925; and G. De Ruggiero, *Filosofi del Novecento*, 1934.

Gentili, Alberico (1551-1611), It.-Eng. jurist, b. in San Ginesio, in the march of Ancona. He was a doctor of civil law of the univ. of Perugia, but left Italy in consequence of having adopted Protestantism. In 1588, through the patronage of the earl of Leicester, he became regius prof. of civil law at Oxford. His chief work is the *De Jure Belli libri tres* (1598), but his earliest known work was the *De Legationibus*, pub. in 1585. The *De Jure* was an enlargement of the *De Jure Belli commentatio prima*, pub. in 1588, and two other treatises of the following year. They treat of the laws of war, the causes of making it, the mode of carrying it on, and the rights of conquerors and conquered—all opportune topics at the time England was threatened by the Armada (1588), when the conduct that would be pursued by the Eng. Catholics on the question whether a Papist was right in serving his prince in arms against the pope raised important issues. According to Prof. Westlake, G. rushed into print in 1589 without giving himself time to elaborate his important subject with the fullness he afterwards gave it in the largely expanded

work of 1598. This classic, indeed, is admittedly superior to the work of Ayala (*q.v.*), being far more complete and free from the irrelevant consideration of tactics and military administration. But it is inferior to the work of Ayala in principles, notably in his manner of dealing with the cardinal problem of whether a war can be *justum bellum* on both sides, so as to have legal effects, i.e. in changing the property of things captured. Nothing, too, is to be derived from G. in mitigating the ferocity of war; and, again, he argues that it is both just and expedient to kill hostages. The best Eng. ed. of the *De Jure* is that of T. R. Holland (1877). See also *The Collected Papers of John Westlake on Public International Law*, 1914.

Gentleman. The term 'G.' is of very vague and shifting meaning to-day, but though it has almost become a politer synonym of 'man,' as 'lady' has of 'woman,' every one recognises that, properly regarded, it implies something of good manners, good taste, good education, and good feeling for others. In a more usual and general sense it is applied to one of a certain social position, and its definition may range from the celebrated one of the witness in *Martell's trial* as a 'man who kept a gig,' to that of one who, by birth, education, wealth, or manners, occupies a certain place in society without, nowadays, much reference to his profession, business or trade. It is of more interest to turn to the hist., which has been much confused since, in the sixteenth and seventeenth centuries, a fiction of official heralds made 'gentlemen' and 'gentry' a separate order or rank and confined its members to those who had the right to bear a coat of arms as recognised by the college of Heralds. Antiquaries and historians have much disputed whether in England there ever was a distinct order corresponding to the lesser nobility of France or Germany (*Adel*). Certainly there never was a distinctive mark attached to a name, signifying such a rank as is found in the nobiliary particles *de* in Fr. or *von* in Ger. Early Eng. records in which 'de' occurs imply the place where the man or family lived, and in the fifteenth century was dropped; thus William *de* Pedlington became Wm. Pedlington. Apart from this, the definite early meaning was that of its derivation, a man of 'gentle' birth, Lat. *gentilis*, and so in genealogies, etc., *generous*. See Wm. Harrison's *Description of England*, B. 5, 1577; and J. Selden's *Tules of Honour*, 1671; the most interesting researches of Sir George Sitwell, 'The English Gentleman,' *Ante-* *tor*, April 1902; and for an exhaustive collection of quotations, etc., A. Smythe Palmer, *The Ideal of a Gentleman*, 1908.

Gentleman's Agreement, modern political term denoting an informal agreement based on verbal assurances or the exchange of mere letters unsupported by the signing of any formal treaty.

'Gentleman's Magazine, The,' was estab. in 1731 by Edward Cave, and was the first example of the use of the term

magazine. The magazine began by reproducing matter from the weekly journals, with a supplementary section giving the principal news of the month, a list of births, marriages, and deaths, etc., and a register of books pub. A few years later original matter began to appear, including the 'Debates in the Senate of Lilliput.' It was valued for its plates and engravings, and especially for its biographical, historical, and antiquarian articles, which give its old vols. much interest. Samuel Johnson joined the staff in 1738, and his writing, from notes taken by others, of the reports of debates in Parliament is a well-known landmark in the hist. of parl. reporting. The magazine, with its familiar editorial name of 'Sylvanus Urban,' continued on the original lines till 1868, when a new series of lighter type was begun.

Gentlemen-at-Arms, in full the 'King's Bodyguard of the Honourable Corps of Gentlemen-at-Arms,' consists at present constituted of thirty-nine 'gentlemen,' being officers of the army who had received a decoration for war services, with a clerk of the chequer and adjutant, a sub-officer (or harbinger, sent in advance to procure lodgings), a standard-bearer, a lieutenant, and a captain, the last of whom must be a peer and a member of the ministry retiring with the gov. The corps was estab. as a purely military body in 1862, and officiates as the first bodyguard of the sovereign at palace functions and royal ceremonies. It directly descends from the body of 'pensioners,' founded by Henry VIII. in 1509, who were the younger sons of noble families.

Gentz, Friedrich von (1764–1832), Ger. publisher and statesman, b. at Breslau. A trans. of Burke's essay on the Fr. Revolution (1791) was followed by other trans. and the founding of a Jour. in which his brilliant articles soon became famous. He served for a time under the Prussian Gov., but in 1802 various causes combined to make him leave Berlin, and he went to Vienna and entered the service of the Emperor Francis. A brief visit to London brought him into touch with Pitt and Granville, and with his wonderful grasp of affairs he used his pen unsparingly against Napoleon. Throughout the war between Austria and France he was employed by Stadion in writing proclamations, etc., and, when Metternich succeeded the latter, he became his chief adviser. He was secretary to the congress of Vienna (1811–15), and to all those that followed, and remained a power until his death. Though he received large sums for his writings, he was quite fearless, and always wrote from conviction; his writings are valuable both as hist. and literature. See E. Guglia, *Friedrich von Gentz*, 1901, and C. J. Burckhardt, *Gestalten und Mächte*, 1911.

Genus. In biological nomenclature, when sev. species resemble each other so distinctly that their general characters indicate relationship, they are grouped together in a G. Similar genera are grouped together to form a family. Systematic classification is as natural as possible, but it is often difficult to know

where to draw the line; but in all cases the characters which distinguish one G. from another must be greater than those distinguishing the species of the genera. The family Ranunculaceae is made up of many genera of which *Ranunculus*, *Clematis*, *Aquilegia*, and *Thalictrum* are a few examples. They belong to one family, but differ from one another in sufficiently characteristic details, so that each may constitute a G. They are further subdivided into species; thus we have *Ranunculus aquatilis*, the water buttercup; *R. flaccia*, the lesser celandine; *R. acris*, the common buttercup, etc.

Geochronology, young branch of science, which draws its methods from geology, botany, zoology, and physics, and whose chief objective is the development of time-scales in years which extend back into the distant past beyond the historical calendar. The first field of application of G. is in prehistoric archaeology and human palaeontology; the second is that of biological evolution in relation to time. See F. E. Zeuner, *Dating the Past: an Introduction to Geochronology*.

Geodesy (Gk. γῆ, and διαιρέω, to divide) is essentially the science and art of surveying on a large scale in order to ascertain the true form and dimensions of the earth. To this end the most rigorously exact methods of measurement at all stages must be employed. Angular measurements involve the use of theodolites of the most perfect construction, graduation, and workmanship, while linear measurements may be made by compensated metal rods, glass rods, pine rods, steel wires, steel or invar tapes or chains under precise tension, all carried on specially designed and accurately levelled supports and read by microscopes in conjunction with standard thermometers. Corrections are applied for the earth's curvature, reduction of observations to mean sea level and standard temp., variations in gravity, instrumental and personal errors, etc. Small errors, which would be negligible in a small survey, multiply enormously over countries whose areas may cover hundreds or thousands of sq. m. Hence the need for the extremely high standard of accuracy involved in geodetical surveying and the explanation of its being accepted as the basis for all forms of surveying—of which there are many—treated more fully later.

The problem of the earth's figure—quite apart from utilitarian aspects—has occupied men's minds from very early times. Probably the earliest recorded effort was that of Eratosthenes, a Gk. mathematician, who, in the third century B.C., on Egyptian soil essayed to measure an arc of the meridian between Syene and Alexandria. Assuming the earth to be spherical, and the respective lats. and the measured distance between the two places having been ascertained, the altitude of the sun at Alexandria was observed by the gnomon at midsummer, and the radius of the meridian, together with the length of the earth's meridional circumference, could accordingly be calculated. Considering the crude instruments then

available the result of this early operation was surprisingly accurate.

More than a thousand years now intervened, until at last man's scientific instincts again slowly awoke. In the determination of this interesting problem of the figure of the earth, measurements of arc, undertaken in various countries and in different lats., have been of great service and afford a gratifying example of good-will and international co-operation in those early days strange; at variance with the trend of affairs to-day. France, Russia, Prussia, Sweden, Denmark, Hanover, Peru, S. Africa, India, and Great Britain have each in turn contributed a share to the investigation of the problem. The grand Fr. arc, passing through Paris and extending from Dunkirk to Formontor, covered over twelve degrees of lat.; the prolonged arc of the great Indian triangulation reached to nearly twenty-four degrees; while the great Russian arc, carried up from Bessarabia to the far N., exceeded twenty-five degrees. Notwithstanding all this, the geodetic measures which most materially contributed to the historic determination of the figure of the earth are singularly few. They are: (1) The arc de Pérou measured by the Fr. academicians P. Bouguer and C. M. de Condorcime in the middle of the eighteenth century; (2) The I.r. arcs measured by Delambre and Mechain about the end of the eighteenth century and by Biot and Arago early in the nineteenth; (3) The Brit. arc from Dunnose in the Isle of Wight to Saxavord in the Shetlands; (4) The great arc of meridian of India; (5) The Russo-Scandinavian arc from Hammerfest to the mouth of the Danube; (6) Various triangulations in central Europe by Schumacher, Gauss, and Bessel; (7) Maclear's arc at the cape of Good Hope. Many efforts have also been made by different observers to determine the figure of the earth from the behaviour of pendulums at different lats. in different parts of the globe; but the results have been both unexpected and inexplicable. Observations on arcs of meridians have revealed similar discrepancies. By the middle of the eighteenth century it was definitely accepted for the N. hemisphere that the further one goes N. the greater is the distance corresponding to a degree of lat.; the flatter therefore is the earth towards the poles. But the result of the abbé de Lacaille's measure of an arc of meridian at the cape of Good Hope was a contradiction—as it seemed to show that the S. hemisphere was prolate, the degree decreasing in length as the pole was approached! A somewhat similar discrepancy was found in England—the curvature of the S. half of England appearing to be less than the N. half!

The origin of those and other abnormal results has been interpreted in local deviations of the vertical. Every observed lat. and long. is affected by local irregularities in the direction of gravity due to the unequal distribution of mass in the crust of the earth. These discrepancies are embarrassing—and although many geodetical conferences have taken

place an agreed general statement on such matters appears still to be lacking. Local deviations of gravity have their effect on azimuths as well as on lats. and longs.

The principle of triangulation forms the sole foundation for all large-scale geodetic surveying, in which the greatest attainable accuracy is essential. This principle rests on the basic mathematical fact that every triangle has six parts—three sides and three angles; and that if any three of these parts (one of them, at least, being a side) are known, the remaining three parts can be calculated without any further measurement, either of sides or angles. With this new information, contiguous new triangles can be constructed by taking angular observations from the terminal points of the new sides to well-continued indefinitely. The first requisite, defined prominent natural objects such as church steeples or new artificially constructed stations with flag-staffs or other permanent signals—this process being therefore, of any geodetical survey is to start the triangulation with a very carefully selected base line, say from 5 to 10 m. long, reasonably level, measured with extreme accuracy as already generally described, and subject to complicated corrections and adjustments. The usual method of meridional triangulation is for a chain of 'well-conditioned' triangles to be formed in the required direction, as in France, Spain, and Austria; while in Italy, Sweden, Norway, Germany, Russia, and U.S.A. oblique chains of triangles are formed. Occasionally, as in India, the combination of triangles forms successive polygonal figures, the sides of the triangles seldom exceeding 40 m. in length. The whole area of India has now been surveyed. (For corresponding progress in Great Britain and Ireland see ORDNANCE SURVEY).

So far as is known, the principle of triangulation was first applied by Snellius, a Dutchman, in 1615, with the primitive instruments then available. The subsequent observations of Riecher caused Huygens and Newton to question the hitherto current assumptions that the earth was a perfect sphere, and actual measurements of terrestrial arcs were accordingly undertaken, as already described, and are going on in many parts of the world to-day. Although for the purpose of geodetical surveying the figure of the earth is provisionally regarded as spherical (in order to admit the direct application of spherical trigonometry), it is now established, as a result of the extensive surveys already made, that the figure of the earth is an irregular *geoid*, which closely approximates to that of an oblate spheroid. This latter is a regular geometrical solid generated by the rotation of an ellipse about its minor axis, the relation of the minor (polar) and major axes in the case of the earth being about 300 to 301.

The importance of geodetic surveying has been increasingly recognised, and advances in scientific knowledge and in the construction of instruments of remarkable precision have led to the formation of an International Geodetic Association which, among other matters,

prescribes methods and the limits of allowable errors in the conduct of operations. Base lines are measured on either (1) the long-length or (2) the short-length systems. The former includes the apparatus of Jadarin, Wheler, Guillaume-Carpentier, etc.; the latter that of Colby, Bessel, Borda, Struve, Ibanez, etc. There have been alternating vogues, but now the long-length system appears to be generally favoured. Neither instruments nor observers are infallible; and, whatever the accuracy of either, certain corrections and adjustments of the original observations always require to be made.

As regards steel base tapes, these consist of corrections due to (1) temp., (2) elasticity, (3) sag, and (4) slope; reduction to sea-level datum being a later consideration. In calculating the lengths of the sides in a system of spherical triangles three methods may be employed: (1) spherical trigonometry, (2) Delambre's method, (3) Legendre's method. Most of the triangles of the United Kingdom Ordnance Survey were computed by Delambre's method and checked by Legendre's method, while all three methods were used in the calculations in connection with the meridional arc which formed the basis of the metric system. Instrumental and observational errors constitute another class requiring corrections. They may take the form of discrepancies between results obtained by different methods and different series of measurements. They involve the 'weighting' of observations and the theory of probabilities, and are generally adjusted by what is known as the method of 'least squares'—a complicated and laborious mathematical operation unsuitable for detailed description to the general reader.

The rigid application of this most accurate method to the geodetical survey of the Brit. Isles—if adjusted in one mass, the whole of the angles being simultaneously involved—would have entailed the solution of 920 equations of condition and the same number of unknown quantities as a part of the work. Avoiding this, the triangulation was divided into twenty-one 'figures,' the equations being reduced to a maximum of seventy-seven, with an average of forty-four in a figure. Each section (or figure) had its own staff of computers and they were thus enabled to complete the work within their lifetime! Having accomplished its primary aim of determining the figure of the earth, the geodetical survey movement, as a whole, has fulfilled other important functions—for example, the preparation of accurate maps of probably every country in the world, and the establishment, both in the field and on the maps, of permanent stations, or 'trig-points,' between which subsidiary topographical or other surveys could be subsequently fitted in. Material for geological and archaeological survey, also, was incidentally accumulated, with great benefit in the case of Ireland. Theodolites used in a geodetical survey vary in size according to the importance of the station to which they are assigned and the quality of the work they have to do. In

the United Kingdom Ordnance Survey the diameter of the horizontal circles ranged from 10 to 36 m. The instruments rested on a firm foundation accurately centred over the station point which was permanently marked for future identification and protected (not always successfully) from ignorant disporters.

The important question of scaffolding and of signalling arrangements between stations can only briefly be referred to here. When it is necessary for the purpose of commanding particular points to elevate the theodolite a framed triangular scaffold may be set up around this in independent rectangular scaffold for the observer and inside the instrument scaffold a wooden tube would be provided

Geodorum, name given to seven species of Orchidaceæ which are found in the West Indies; they are called earthy scented orchids.

Geodynamics, study of the nature and the working of the forces whereby the rocks of the earth's surface are formed and changed. This involves investigation of the relations between the interior and the surface of the earth and a discussion of the various agencies which mould the terrestrial forms. The subject includes the effects of volcanoes, earthquakes, and other disturbances on the distribution of oceans and continents, on the outline of the coast, on the form and bottom of the ocean bed, their effects on climate, and on races of plants and animals on the earth's



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to shield the plumb line—preferably made to rotate so that the leeward side can remain open for inspection. The scaffolds for the U.S.A. Great Lakes Survey ranged from 10 to 12 ft high, with an average height of 55 ft—the signal standard being from 30 to 30 ft higher. It is found desirable that all arcs at a station should have one joint in common to which all angular measurements may be referred; this is known as the referring object. On mt tops two rectangular plates of metal are placed in line, so that light seen between them against the sky appears as a vertical line about 10 sec in width; this vertical referring object would be set up at a distance of from 1 to 2 m. away from the observatory. See also GEOGRAPHIC (LIVERPOOL OBSERVATORY), 'LEAST SQUARES ORDNANCE SURVEY', SURVEYING, THEODOLITE, TRIANGULATION, etc. See A. R. Clarke, *Geodesy* 1880, H. Helmert, *Die mathematischen und physikalischen Theorien der höheren Geodäsie* 1883, J. Lilkington White, *The Ordnance Survey of the U.K.*, 1886; J. H. Gore, *Geodesy* 1911; A. R. Hinks, *Maps and Survey*, 1912, and A. L. Higgins, *Higher Surveying* 1944.

surface and the intercalation of all these to one another. A vast cycle of change is presupposed and a knowledge of the present order of nature is made to provide a solution of the mysteries of the past. For convenience of study the subject is divided into (1) Hypogene or plutonic action (2) Epigene or surface action. The former section deals with the changes of the interior of the earth and these are conveniently divided into

(a) *Volcanic Action*.—This will be described in detail elsewhere but vulcanism is one of the great forces by which the topography of the earth's surface is altered. The building up of a volcano cone as a result of continued activity, the destruction of life and property, the alteration of hydrography through the limming of river valleys are surface phenomena, but beyond the visible effusion of lava dust and vapours many deep seated changes of great importance are occurring.

(b) *Earthquakes*.—Rupture or collapse of rocks under great strain is usually the determining factor of this form of seismic disturbance, which frequently results in altered surface features.

(c) *Slow Depressions and Upheavals.*—Measurements prove that certain parts of the earth's surface are at the present day showing signs of depression. The W. side of Japan has within recent times had many of its one-time fields replaced by beaches and banks of shingle. S. Sweden is sinking. Parts of Britain possess submerged forests which are sometimes uncovered by a low spring tide. The North Sea is a region of but recent subsidence—recent from a geological point of view. On the other hand, old raised beaches or strand lines point to upheavals in many areas.

(d) *Mountain Making.*—The contraction on cooling of the earth's crust has resulted in complex strains which in some areas have crumpled, folded, and contorted the upper strata. The Alps and many other m't. masses are the results of great folding effects.

(e) *Metamorphism.*—The high temp. and enormous pressure existing within the earth's interior, coupled with mechanical movement, cause great alterations in the composition and structure of the constituent rocks.

2. *Epicene or Surface Action.*—This will differ from hypogene in that its cycle is relatively short and its effects are more readily visible. The most important surface agents are:

(a) *The Air.*—The atmosphere causes well-marked effects; by its transporting action the sand dune is built up and the loess area formed, and the bombardment by wind-borne particles results in extensive erosion.

(b) *Water.*—Rain acts as a solvent and leads to the disintegration of the hardest rocks. Rivers and brooks transport solids from the higher grounds and build up immense tracts of alluvium in their lower valleys, e.g. deltas, etc. Their continued action deepens the valleys and dissects the masses of high land. Frozen water in the form of ice streams or glaciari scrapes, grinds, and tears the surface over which it flows, while the destructive mechanical action of the sea is visible everywhere.

(c) *Plants and Animals.*—These act both directly and indirectly. The former are capable of modifying climate, and their constant utilisation of CO_2 is closely linked with other existences. One important effect of animal life is seen in the building up of the immense coral reefs of tropical seas.

(d) *Man.*—Man enters largely into the scheme of G. His activities result in many alterations of surface features; both directly and indirectly he is increasingly controlling and modifying many of the other epicene agencies.

Geoffrey of Monmouth (d. 1154), bishop of St. Asaph and author of a Brit. hist. The exact date of his birth is unknown, but it was about 1100. His first ed. of the famous *Historia Britonum* of Nennius was pub. in 1139, though the text now preserved apparently dates from 1147. According to the author the book was a trans. of a Celtic MS. which Walter, arch-deacon of Oxford, had brought from Brittany, but the probability is that it

was a mixture of historical fact and tradition culled from Nennius and the author's own fertile imagination. There is no mention, for example, of Merlin in the work of Nennius, and though there was probably a bard of that name—Myrddhin in Welsh—who may have been a contemporary of Arthur, he owes most of his attributes to the fertile invention of G. of M. In any case the result was immediate success, and his influence on the literature of the next hundred years was unmistakable. The Arthurian legend was the most popular and laid the foundation of an abundance of poetry and prose, becoming immortalised in Sir Thomas Malory's *Morte d'Arthur*, printed by Caxton in 1485. It is from the work of G. of M. that sprang the *Bruls de Wace* and *Layamon*. *The Prophecies of Merlin*, long attributed to him, is now held by many critics to be not genuine. See E. K. Chambers, *Arthur of Britain*, 1927.

Geoffrin, Marie Thérèse (née Rodet) (1699–1777), Frenchwoman, b. at Paris, who was for a time the leader of a brilliant literary salon in Paris. At an early age she married Pierre François G., a lieutenant-colonel in the National Guard, and it was not until a few years before his death in 1750 that she became a leader in society. Twice each week she would entertain at dinner artists and literary men of her acquaintance, towards whom it pleased her to play the mentor. Hume and Horace Walpole were among those who visited her, also Stanislas Poniatowski, whom she afterwards visited in 1766 as king of Poland. Her great delight seems to have been to gather round her the encyclopédistas, she herself being one of the contributors to the *Encyclopédie*. Her *Lettres* and a work entitled *Sur la conversation* were pub. by Morelet. See *Correspondance inédite du roi Stanislas Auguste Poniatowski et de Madame Geoffrin, 1764–77*, ed. by the comte de Mouy, 1875; *G. de Ségrur, Madame Geoffrin et sa fille, 1897*; and *Janet Aldis, Madame Geoffrin, her Salon and her Times, 1750–77, 1905*.

Geoffroy Saint-Hilaire, Etienne (1772–1844), Fr. naturalist, b. at Etampes, in the dept. of Seine-et-Oise. From 1793 to 1798 he was prof. of zoology at the natural hist. museum in Paris, then he went to Egypt with the scientific expedition sent out by Napoleon Bonaparte. In 1809 he was appointed prof. of zoology in the Faculty of Sciences and pub. a number of works on his theory of the unity of all organic composition, a subject on which he had a famous controversy with Cuvier. His works include *Philosophie anatomique* (1818–20); *Sur le principe de l'unité de composition organique* (1828); and *Philosophie zoologique* (1830). *Sea life in Fr.* by his son (1847), and *Cuvier et Geoffroy Saint-Hilaire, 1890*, by Ducrotay de Blainville.

Geoffroy Saint-Hilaire, Isidore (1805–1861), Fr. naturalist, b. at Paris. He was the son of Etienne Geoffroy Saint-Hilaire, and helped his father in his work until 1838, when he went to Bordeaux to organise a faculty of sciences, remaining

there as prof. of zoology. In 1850 was appointed prof. of zoology to the Faculty of Sciences. In 1854 he founded the Acclimatisation Society in Paris, becoming the first president. He pub. the life of his father in 1847. Other works include *Histoire des anomalies de l'organisation chez l'homme et les animaux* (1822-37); *Essais de zoologie générale* (1841); and *Histoire naturelle générale des règnes organiques* (1831-62, unfinished).

Geognosy, see under GEOLOGY.

Geographical Distribution. The problem of G. D. of animals and plants over the earth's surface has been the subject of close study in modern times. The greatest impetus to such study was given by Darwin's *Origin of Species*, which destroyed the idea that each species was the result of a separate act of creation. The allied species being regarded as having a common origin, it followed that they had a common place of origin, and an explanation of how they came to inhabit the different quarters of the globe in which they are at present found necessarily involved an explanation of many unsolved problems of biology. Both flora and fauna will thrive only in the environment adapted to them, but it is found that animals and plants are absent from countries that appear quite suitable to their development. The existence of natural barriers offers some explanation of this. Thus, Australia is cut off from terrestrial communication with the rest of the world, and so possesses a fauna peculiar to itself, but fossil evidence indicates that Amer. opossums may have been related to the marsupials of Australia and it is supposed that Antarctica was once continuous with New Zealand, Australia, and S. America. Madagascar and Australia were probably cut off from the mainland mass in a comparatively recent geological period. Such isolated regions tend to contain specimens of the fauna which flourished before the separation. The Himalayas mark a great distinction in the fauna to the N. and S., while in Africa the Sahara desert does the same. On the other hand, the mammals of the W. Indies are practically the same as those of America, and the inference is that they have in some way migrated from the mainland. Peculiarly enough, however, the W. Indies possesses one mammal which belongs to an order, Insectivora, entirely absent from S. America, and to a family, Centetidae, all the other species of which inhabit Madagascar only (Alfred Russel Wallace). Similar interesting problems are offered by the fact that the fauna of Japan more closely resembles that of the Atlantic states than of the Pacific states of N. America; that the mammals and birds of N. America approximate more to those of Europe than of S. America, that the fauna of Madagascar has much in common with that of the Malay Archipelago, and so on. In considering such questions attention must be paid to the processes by which the distribution of species can take place. Natural locomotion is, of course, the usual means, and birds possess the greatest

power in this respect. Apart from normal methods, however, there are other agencies at work. The wind can convey the spores and seeds of plants many hundreds of miles. Winds are also of great account in conveying insects, while birds are often blown immense distances out of their course, and the eggs of fish, frogs, etc., are often conveyed by the wind moving the surface of the water. Sea currents are an important factor in the distribution of plants and animals. Darwin (see *Origin of Species*, c. xii.) conducted a series of experiments that showed the great vitality of seeds after immersion in salt water for periods varying from 28 to 137 days, and also the power that seeds possess of floating for prolonged periods upon the surface of the water. In addition, animals are conveyed by sea currents upon such natural rafts as icebergs and ice-floes, drifting trees, etc. Birds may convey seeds or insects upon their feathers or in the earth adhering to their feet, while many seeds pass uninjured through the digestive organs of birds and beasts and are thereby transported to new lands.

Distribution is, on the other hand, prevented by many methods. Mammals migrate slowly, and mts., deserts, and marked differences of temp., are barriers to their distribution. Forests hinder the migrations of camels, giraffes, zebras, etc., treeless regions those of apes and monkeys. Climate also impedes dispersal, while the presence of a natural enemy has also to be taken into account. The tsetse fly, for example, which conveys the parasitic trypanosome causing the disease nagana, has prevented the introduction of horses, dogs, and cattle into a certain area in Africa, while another fly acts in the same way in Paraguay. The more evenly the various species are distributed over the globe the less easy it is to map out the regions they inhabit, and the less valuable are the possible deductions to be made therefrom. The cryptogams, whose spores are carried in all directions by the wind, are so widely distributed that they are usually left out of all biogeographical schemes. In the same way it is difficult to mark off fixed limits for sea animals, although attempts have been made to do so by classification into littoral, pelagic, and abyssal fauna, according as the animals inhabit the sea near the shore, the open sea, or the depths of the ocean. Again, birds, having greater power of locomotion, are more widely distributed than other mammals. N. America and Asia were great centres of evolution and, as successful new species were evolved, the survivors of dying-out races were driven to the S. ends of the land masses.

Distribution of Animals.—The following is the scheme of distribution of animals adopted by A. R. Wallace in his *Island Life*. It is based principally upon the distribution of land mammals, but corresponds with a considerable degree of accuracy to that of birds. It includes six divs.: (1) Palaearctic region, including Europe, temperate Asia, and Africa to the N. of the Sahara. (2) Ethiopian region, including Africa, S. of the Sahara, and

Madagascar. (3) Oriental region, including India, S. of the Himalayas, S. China, and the Malay Is., as far S. as the Philippines, Borneo, and Java. (4) Australian region, including Australia, New Guinea, Celebes, Lombok, and the is. of the Pacific, New Zealand being regarded as a very peculiar sub-region. (5) Nearctic region, including N. America as far as Mexico. (6) Neotropical region, including central and S. America with the W. Indies. The above scheme, though favoured by its simplicity, is nevertheless hardly sufficiently accurate. For example, it ranks the div. between the Nearctic and Palearctic regions, whose faunas have much in common, as high as that between the Australian and Neotropical, where the faunas are of quite different character. For this reason modifications of it have been advocated by Heilprin and other biologists. These systems will be found fully dealt with in R. Lydekker's *A Geographical History of Mammals* (1896). The following is the system now usually adopted: (1) Arctogeoic realm, divided into five regions—(a) Holarctic region, including the Palearctic and Nearctic regions of Wallace's div., with the exception of parts of Mexico and California; (b) Oriental region as in Wallace's system; (c) Ethiopian region as in Wallace's system, except Madagascar and adjacent isles which form the (d) Malagasy region; (e) the Sonoran region, embracing the N.W. parts of Mexico and Lower California. (2) The Neogeic realm, corresponding with the Neotropical region of Wallace's system. (3) The Notogeic realm, including Australasia, divided into four regions—(a) Australian region, i.e. Australia proper, Tasmania, and New Guinea; (b) Austro-Malayan region, containing the is. between New Guinea and Bali; (c) Polynesian region, containing New Zealand and certain isles of the Pacific; (d) Hawaiian region, including the Sandwich and other isls.

In the Holarctic region are found such distinctive mammals as the bear, sheep, glutton or wolverine, marmot, reindeer, beaver, bison, skunk, and raccoon. The Oriental region includes the elephant, hyena, tiger, leopard, panther, tapir, rhinoceros, monkeys, apes, crocodiles, as well as deer, cattle, and pigs. The Ethiopian region includes the elephant, hippopotamus, giraffe, zebra, rhinoceros, antelope, panther, leopard, lion, gorilla, chimpanzee, and lemur; the Malagasy region is characterised by a prevalence of lemurs, and by the absence of the African mammals, while the Sonoran region shows a mixture of Arctogeoic and Neogeic forms. In the Neogeic realm are to be found anteaters, llamas, sloths, armadillos, tapirs, and peccaries, marmosets, opossums, alligators, crocodiles, humming-birds, etc., while there is an absence of sheep, horses, and goats. In the Notogeic realm we find in the Australian region an abundance of marsupial or pouched animals, such as the kangaroo, wallaby, etc., as well as the monotremes (duck-billed platypus and spiny anteater), which are peculiar to this region; in the Austro-Malayan region a mingling of Aus-

tralian and oriental forms, in the Polynesian and Hawaiian regions an absence of mammals, the two latter regions being distinguished only on account of the difference of their birds. The peculiar nature of the Australian fauna, which consists of a great variety of marsupials and lacks almost all species of mammals existing in the rest of the world, has been explained by Wallace as being due to the fact that the marsupials formerly spread over the rest of the world, but were gradually displaced by later types of mammals and only managed to survive in Australasia owing to their isolation. The boundary line between the Australasian and other systems is the deep channel between the is. of Bali and Lombok, and is known as Wallace's line.

The Distribution of Plants.—The distribution of plants has been the subject of many attempts at classification, but has not yielded any scheme which is so clearly defined as that given for animal life. As early as the middle of the eighteenth century, we find the Linnaeans attempting to account for the distribution of plants over the surface of the globe. At the beginning of the nineteenth century Alexander von Humboldt paid great attention to the question of botanical geography, and suggested the use of distribution maps, while J. F. Schouw, a Dutch botanist, enunciated a system in 1833, dividing the earth's surface into eighteen kingdoms occupied to a greater or less extent by characteristic flora. He, however, made no attempt to deal with the origin and hist. of the various plant forms, but regarded them rather as created to a great extent in the locality in which they are found. Some years later, Meyen divided the globe into zones, adopting lines of lat. as the zone frontiers. His system comprised the following eight zones: (1) Equatorial, lying between 15° N. and S. lat.; (2) Tropical, extending N. and S. from the 15th parallel to the tropics of Cancer and Capricorn; (3) Sub-tropical, from the tropics to 31° N. and S. lat.; (4) Warmer Temperate, between 34° and 45° lat.; (5) Colder Temperate, between 45° and 58° lat.; (6) Sub-Arctic, from 58° N. lat. to Arctic Circle; (7) Arctic zone from Arctic Circle to 72° N. lat. (8) Polar zone, above 72° N. The Antarctic region was left out of account in this scheme as possessing no land flora. It was subsequently modified by the substitution of isotherms for parallels of lat. as the zone-boundaries, but was only a very general div. of the earth's flora. The first zone was characterised by palms and bananas and extremely luxuriant vegetation, the second by tree-ferns and figs, the third by myrtles and laurels, the fourth by magnolias, the fifth by forests of deciduous trees, the sixth by conifers, the seventh by dwarf birches, alders, and willows, and by lichens, the eighth by saxifrages and cryptogams.

After Meyen, de Candolle proposed a scheme of grouping plants, the main principle of which was the consideration of the temp. necessary for their growth. In it plants were divided into megatherms,

mesotherms, and *microtherms*, according as they required a tropical, moderate, or cool temp. This scheme had the advantage of being applicable to vertical as well as horizontal distribution, but is now obsolete. The first real step towards classifying the distribution of plants upon modern lines was, however, made by Bentham in 1869, in his presidential address to the Linnean Society. He recognised the existence of three floral realms (1) the N. including conifers and deciduous forest trees, together with the ranunculaceae (buttercups), spreading over Europe, N. and Central Asia, and the greater part of N. America; (2) the Tropical, lying between the N. and S. realms and characterised by evergreen Polyptala (i.e. with the petals of the flowers not fused), and palms; (3) the S., containing the flora of the lower part of S. America, S. Africa, and Australasia, much more complex than the N. realm, and broken up into many scattered floras, which also sent extensions northward across the equator into the N. realm, as exemplified by the flora of Mexico and California. Bentham's successors were led to study the question of distribution from a historical aspect, and arrived at the conclusion that the tropical flora during the Tertiary period extended far beyond its present limits. In particular De Saporta studied the fossil flora of the Eocene period in Provence, and found that it was closely akin to that of India, China, and the Philippines. These and other investigations led to a scheme of distribution based upon the state of the flora of the Tertiary period, in which Drude and Engler have specially distinguished themselves. The scheme made out by Drude is much the simpler. He distinguishes sea flora from land flora, and divides the latter into three main groupings (1) the Boreal group, including the N., Inner Asiatic, Mediterranean, E. Asiatic, and Central N. Amer. sub-groups; (2) the Tropical group, including the Tropical African, E. African is., Indian, and Tropical Amer. sub-groups; (3) Austral group, including the S. African, Australian, New Zealand, Andine, and Antarctic sub-groups.

Engler's system is far more complicated. He first distinguishes four main 'elements' in the flora of the Tertiary period, viz.: (1) The Arcto-Tertiary, characterised by abundance of conifers and numerous genera of trees and shrubs now common in N. America, Europe, and Extra-tropical Asia; (2) the Palaeotropical, characterised by many families prevalent in the tropical parts of Africa and Asia, and by the absence of certain families found in the Arcto-Tertiary element; (3) the Neotropical or S. Amer., which had, according to Engler, very much the same character as the present flora of Tropical Brazil and the W. Indies; (4) the Old Oceanic, consisting of forms capable of traversing wide stretches of water and of developing upon is.

Upon the lines of these 'elements' of Tertiary flora Engler divided the flora of the present day into four 'kingdoms,'

each being further subdivided as follows: (1) N. Extra-tropical, including the nine divs.: Arctic, Sub-Arctic, Central European, Central Asiatic, Micronesian Is., Mediterranean, Manchu-Jap., Pacific N. America, and Atlantic N. America; (2) Palaeo-tropical, including the ten divs.: W. African, Afric-Arabian, Malagasy, Further Indian, Tropical Himalayan, E. Asian, Malayan, Araucanian, Polynesian, and Sandwich Is.; (3) S. Amer., including the five divs.: the Mexican Highlands, Tropical Amer., Andean, the Galapagos, and Juan Fernandez; (4) Oceanic, including the eight divs. Antarctic S. America, New Zealand, Australian, Keruelen, Amsterdam Is., the Cape, Tristan d'Acunha, and St. Helena. Since Darwin drew attention to the operation of natural selection, it has been generally accepted until quite recently that species and genera few in number were relics of unsuccessful and moribund races. J. C. Willis, however, has given conclusive evidence that this is not necessarily the case, for just as natural selection requires long periods for the conclusion of its operations, long periods of time are also essential for the dispersal of new species. If natural barriers prevent this dispersal, the new species will remain local and cover only a comparatively small area. Even so, it may maintain its position without decreasing if it be well estab., but any new species not adapted to the environment will be killed almost immediately by the operation of natural selection. On the other hand, if no natural barriers hinder the distribution, the species, given sufficient time, will gradually spread. Thus the areas occupied by plants may give an indication of the relative ages of the species, the oldest being those which have had time to become widely distributed. Moreover, in the case of is. separated early in geological hist. from the mainland, birds probably were some of the most active agents of plant dispersal, but in the course of time the birds became better adapted to conditions of life on the is. and visited the mainland less frequently until at the present time birds take very little part in plant dispersal beyond the boundaries of such is. Consequently, new species arising in such isolated positions have more limited means of dispersal and will spread very slowly, if at all.

On account of the cooling of the N., plants and animals have migrated southwards. At some time in the future a northward migration will almost certainly be evident, for as species living near the present N. temp. barriers become acclimatised, or better adapted species are evolved, these barriers will recede. The importance of time for distribution cannot be too strongly emphasised.

See A. de Candolle, *Géographie botanique* (2 vols.), 1853; C. Darwin, *Origin of Species*, 1859; A. Murray, *Geographical Distribution of Mammals*, 1866; Sir J. Hooker, *Introduction to the Flora of Tasmania, and Handbook of the Flora of New Zealand*, 1867; G. Bentham, presidential address to the Linnean Society,

1869 (*Journal Linnean Society*, x.); J. G. Baker, *Elementary Lessons in Botanical Geography*, 1875; A. R. Wallace, *Geographical Distribution of Animals*, 1876, and *Island Life*, 1880; A. Grisebach, *Die Vegetation der Erde*, 1884; O. Drude, *Die Floreneiche der Erde*, 1884; A. Heilprin, *The Geographical and Geological Distribution of Animals*, 1887; F. Beddoe, *Textbook of Zoogeography*, 1895; H. Borgeson, *Creative Evolution*, 1907; E. C. Semple, *Influence of Geographical Environment*, 1911; F. Clements, *Plant Succession*, 1916; J. Willis, *Age and Area*, 1922; W. Heape, *Emigration, Migration, and Nomadism*, 1931; A. F. W. Schimper, *Pflanzengeographie*, 1935; and M. I. Newbiggin, *Plant and Animal Geography*, 1936.

Geographical Societies. The Royal G. Society was founded in 1830; in 1831 it incorporated the African Association, and in 1834 the Palestine Association. Three medals are awarded by the society annually to distinguished workers in geographical causes. The society publishes the *Geographical Journal* every month. Its building is in Kensington Gore, London. Other important G. S. are the Liverpool G. Society, (founded 1891), the Manchester G. Society (founded 1881), under the patronage of the king, which publishes an annual journal; the Tyneside G. Society, the Royal Scottish G. Society (founded 1884), which publishes twice each month the *Scottish Geographical Magazine*; and the G. Association, which publishes a quarterly, *Geography*.

Geography is that branch of science which deals with the phenomena of the earth's surface. The early Gk. concept of the earth was that of a flat disk in the shape of an ellipse bounded by an ocean riv. This concept was generally held during the Homeric period. The Phenicians were among the first people to explore unknown lands, and they navigated the whole of the Mediterranean and the Euxine, and passed through the straits of Gibraltar into the Atlantic. They planted colonies in Asia Minor and along the shores of Africa, one of which, Carthage, founded in the ninth century B.C., was later to dispute with Rome the supremacy of the world. Certain Phenician explorers were also reputed to have circumnavigated Africa during the seventh century B.C. Thales of Miletus is claimed as the first advocate of the spherical earth, which was afterwards adopted by the Pythagorean philosophers, mainly upon the theoretical ground that the sphere was the most perfect figure. Herodotus of Halicarnassus (b. 484 B.C.) has left us in his *History* a complete account of the earth's surface as known in his time, when it was held to be bounded by the Atlantic on the W., the Red Sea and Indian Ocean on the S., and Persia on the E. The conquests of Alexander, however, opened up new realms to human knowledge, and the conqueror himself sent forth expeditions to survey the various regions he had subdued. About the same time, Pythons of Massilia led an expedition into the Atlantic, through the Eng. Channel to the North Sea, and it is reputed

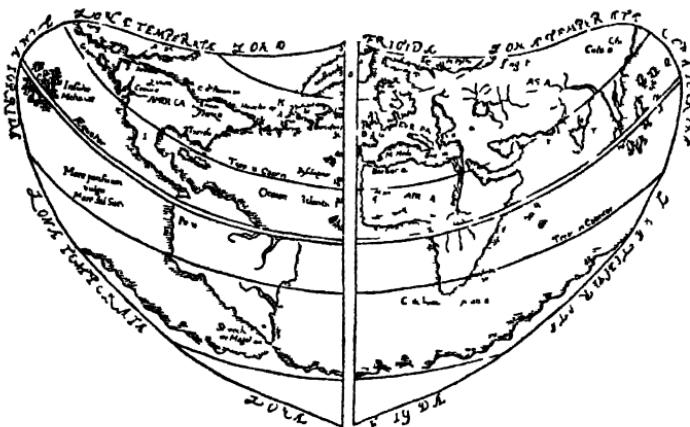
to have reached Thule, which is supposed to be the modern Iceland. Aristotle (384-322 B.C.) devoted considerable attention to the subject of G., and urged three reasons for holding the earth to be a sphere: (1) the tendency of all objects to fall together towards a common centre; (2) the fact that the earth's shadow upon the moon during an eclipse was circular; (3) the shifting of the horizon and appearance of new constellations during a journey from N. to S. He also extended Parmenides' idea of the earth's zones, defining the temperate zone as extending from the tropics to the Arctic Circle, though it is not clear in what sense he used the latter term. Aristotle was also aware of the connection between sea, rain, and river, and studied the effect of climate upon the character of the different races. Further progress in scientific G. was made by Eratosthenes (b. 276 B.C.), who was the first to use the parallels of lat. and long. He held the earth to be a sphere revolving in space, but to him the inhabited portions only included S. Europe, S. Asia, and N. Africa.

During the Rom. empire G. became more a question of actual description of the known world, and Strabo, at the very beginning of the Christian era, summarised all the knowledge of the earth's surface that had been acquired up to the time of Augustus. To Strabo succeeded Pliny (b. A.D. 23), who had himself travelled extensively in Germany, Gaul, Africa, and Spain, and also collected all the information he could from the work of other writers. His work, *Historia Naturalis*, contains accounts of Scandinavia, the course of the Niger, and Mt. Atlas, as well as giving a clearer notion of the G. of Asia. His work was carried on by Claudius Ptolemaeus (c. A.D. 150), who verified the lat. and long. of the principal places and corrected all estimates of distances.

Exploration and Cartography.—During the Middle Ages the knowledge of G. was submerged in the obscurity that overspread all science, but happily Ptolemy's works lived on in Islam. It was only when the journeys of Marco Polo (1271-1295), the Venetian explorer, in the Far E. had again aroused interest in the subject, and subsequent explorations had led to a knowledge of the extension of land from E. to W., that Ptolemy's works were rescued from their obscurity and retranslated into Lat. by Angelus (1410). The fifteenth century saw a great impetus given to G. discovery. In 1488 Diaz discovered the Cape of Good Hope, while in 1497 Vasco da Gama doubled it and proceeded to India. In 1492 Columbus made his momentous voyage across the Atlantic and discovered America, and this feat was speedily followed by an exploration of the coasts of Africa, Asia, and America, while Magellan passed to the S. of America and succeeded in circumnavigating the globe. The rapidly accumulating mass of knowledge led to an improvement in the production of maps and to the development of the cartographical side of G., the New World being

first shown on Juan de la Cosa's map in 1500, while Mercator, in 1569, showed the world upon the system of projection which still bears his name. Ptolemy's work rapidly grew obsolete under such a wealth of discovery, and in 1524 Apian publ. his *Cosmographicus Liber*, basing it upon Ptolemy's system of mathematics and measurements, while Münster followed in 1544 with *Cosmographia Universalis* which is a descriptive work containing

pendulum, barometer, the application of the system of triangulation, thus rendering possible the production of reliable maps. The method of showing heights by contours is due to Ph. Buache (1737), while hachures were devised by Lehmann in 1789. The next important step in the hist. of scientific G was made by the great Ger. philosopher, Immanuel Kant, who lectured on physical G at Königsberg from 1765, and dealt with the subject under the



SIR HUMPHREY GILBERT'S MAP
This map appeared in his Discourse (1576)

an account of the manners of various peoples and the different industries. The next important book on G was pub by Varenius in 1610. He treated G as a science dealing with the form, dimensions, and substance of the earth, the distribution of water, mts., woods, deserts and atmosphere with the celestial properties, &c. lat. and long., climatic zones, etc., while he gave only a secondary consideration to the human side of the science. He was not content with a mere narrative of phenomena, but sought for their explanation, and his system dominated G for more than a century.

In the meantime geographical discovery had progressed on all sides. During the sixteenth century endeavours were made to discover a N.W. passage to India in which Frobisher, Davis, Hudson, and Baffin took part. Sir Humphrey Gilbert wrote a famous Disc. (1576), arguing for the existence of such a passage. In the seventeenth century the Dutchmen, Tasman and Van Diem, discovered Australia, and in the eighteenth century Capt Cook reached New Zealand and discovered many of the Polynesian Is. (see TRIBA ASTRALIS INCOGNITA). During the same period cartography had also greatly improved owing to the use of better instruments, the introduction of the telescope,

five headings of (1) Mathematical G, including the form, size, and movements of the earth, (2) Moral G, the customs of different races, (3) Political G, dealing with countries according to their govs.; (4) Merchantile G, the G of commerce, (5) Theological G, the study of the various religions in its geographical aspect.

Geophysics — The beginning of the nineteenth century led to the foundation of that branch of G known as geophysics, due to the researches of Newton, Laplace, Leibnitz, Laplace, and others, upon the phenomena of gravitation, tides, and the earth's density while geology was estab. by the investigations of Desmarest, Werner, and Hutton upon the nature of rocks and the shiftings due to volcanic disturbances and denudation. These researches were collated by Sir C. Lyell in his *Principles of Geology* (1830-33). Botanical G was promoted by the works of Linnaeus and the two Linnæus, father and son, who accompanied Cook on his voyages and directly interested Alcander von Humboldt (1769-1819) in the study. Humboldt has many claims to be considered the greatest of all geographers. He was a great traveller and acquired a mass of first hand knowledge as well as doing immense work in classifying the knowledge collected by others. He showed that

the forms of land exercise deciding influence upon climate and upon the plants and animals, including human races, that inhabit them. The results of his investigations were pub. in his great work *Kosmos* (1845-58), which remains a classical work on G. He also introduced the use of isotherms and isobars, and by directing attention to the question of vertical relief and the mean height of countries he founded the science of geographical morphology. Humboldt was almost equalled in the immensity of his labours by his contemporary Karl Ritter (1779-1859), who laid stress upon the importance of comparative G. and endeavoured to show the effect of terrestrial relief and climate upon human hist. His colossal work, *Vergleichende Geographie*, begun in 1817, was never completed, only Asia and a portion of Africa being dealt with. He adopted the teleological argument of Christian theologians, and endeavoured to show that the earth had been created so as to meet the needs of mankind in every respect and looked upon the arrangement of land and sea and its general configuration as instruments for guiding man along the line mapped out by divine providence. His bias in this direction led him to devote himself more closely to the historical aspect of G. The undue stress laid by Ritter upon the historical side was corrected by Peschel, who carried on Humboldt's work, and again brought into prominence the physical aspect of the science. His successors have more or less each presented their own personal point of view, devoting special attention to and bringing into special relief one particular aspect of the science. The evolutionary theory had necessarily a great effect upon the view of geographers, and led to the conception of the earth's origin and its gradual cooling through long geological ages, and the effect of its celestial environment upon the form assumed by land and water, thus serving to complete geographical knowledge and invest the subject with a new philosophical dignity.

Geographical Discoveries in the Nineteenth and Twentieth Centuries.—During the nineteenth century the work of geographical discovery went on unabated and many expeditions were sent forth. Amer., Eng., and Fr. expeditions under Wilkes, Ross, and d'Urville visited the Arctic seas in 1840 and led to a whole series of similar expeditions. In 1880 Baron Norden-skjold sailed round the N. of Europe and Asia. The interior of America was explored by Humboldt and others. Africa was penetrated by Bruce, Speke, Living-stone, Emin Pasha, and other explorers. Sturt and Eyre explored the interior of Australia, while the continent was traversed from Melbourne to the gulf of Carpentaria in 1860 by Burke and Wills. Among explorations interesting to note is the journey of Prince Peter Kropotkin in the Trans-Baikal prov. of Siberia and N. Manchuria in 1864, which led to a new conception of the mt. system of Asia. In 1871 Prjevalsky commenced his exploration of Tibet, in which he was followed by many Russian, Brit., and Fr. explorers.

The last quarter of the nineteenth century also saw many important explorations in W. China, Indo-China, and Inner Asia. Between 1894 and 1897 Sven Hedin carried out some highly interesting explorations in the Pamir region, and on the N. boundary of Tibet, while the exploration of Africa is associated with the name of Stanley. Special attention has been given to the exploration of the Arctic and Antarctic regions and to the discovery of the poles. The chief expeditions to this end were conducted by the duke of Abruzzi, in 1899, which reached 86° 23' N. lat. by Nansen, 1893; 86° 14' N. by Andréa, a Swedish engineer, who left Spitzbergen in a balloon with two companions in 1897 and was not heard of again till 1930, when his skeleton was discovered, with those of his companions, and by Scott in 1901 towards the S. pole. Both poles have, however, now been reached, the N. by Peary in 1909, and the S. by Amundsen and Scott in 1912. In addition, mention should also be made of the deep-sea explorations that have been carried out during recent years by the Brit. ships *Challenger* (see CHALLENGER EXPEDITION) and *Discovery I.* and *Discovery II.* (see DISCOVERY COMMITTEE), the Ger. *Valdivia*, and the U.S.A. steamer *Albatross*. See also OCEAN and OCEANOGRAPHY. Of recent years much exploration and geographical survey work has been carried on by means of aeroplanes, while motor vehicles have been used in exploration of the Sahara (Haardt and Andouin-Dubreuil, 1923), and the Gobi desert (Andrews, 1928), etc. In 1926 Amundsen's dirigible *Norge* crossed the N. Pole on a flight from Spitzbergen to Alaska, and in 1928 he was lost on an expedition for the relief of the wrecked dirigible *Italia*. In that year useful observations on meteorological and navigation conditions were made by Capt. Sir Hubert Wilkins on a flight from Alaska to Dead Man's Is., Spitzbergen. Three years later he lost his life when hunting in a kayak, whilst attempting to organise an air-route from the United Kingdom to Canada via Greenland. In Sept. 1936 the famous Fr. explorer, Jean-Baptiste Charcot (q.v.), was lost when the Fr. polar research ship *Pourquoi Pas* foundered off Iceland. In the same year a Soviet hydrographic expedition claimed to have mastered a new sea-route near the Norden-skjold Archipelago. The Soviet Gov. estab. a polar station in the vicinity of the N. Pole in 1937, and Prof. Otto Schmidt headed a Soviet expedition in 1937-38. His report stated that the N. polar summer climate was considerably milder than was expected, and that the Polar Sea was more than 3000 ft. deeper than Nansen's researches had seemed to indicate.

Modern Conception of Geography.—From the foregoing outline of the development of geographical knowledge it will be seen that the conception of G. has greatly altered from time to time, and can indeed be hardly said to be rigidly defined at present. In general G. may be said to be the study of the phenomena of the earth's surface and of its inhab. It can be

divided into the following branches: (1) Mathematical G., dealing with the figure and dimensions of the earth, its position relative to other celestial bodies, its movements as a planet and the effect of such movements upon its crust; (2) Physical G., sometimes called physiography, dealing with the actual physical condition of the various portions of the earth's surface and capable of subdivisions into geomorphology or the constitution of the lithosphere, oceanography, that of the sea, and

refers both to the hist. of the development of geographical ideas, a branch of the hist. of philosophy, and to the progress of actual geographical discovery, a branch of human hist. How far these branches are to be carried is not easy to determine. Mathematical G. borders upon mechanics, geomorphology is closely allied to geology, and biogeography leads naturally to biology. Another div. may be made between general G. and regional G., sometimes termed chorography, which is simply the



E.N.A.

RUSSIAN EXPLORERS AT THE NORTH POLE, 1937

Babuschkin, Schevelev, Schmidt, and Papann

climatology, the phenomena relating to the atmosphere; (3) Biogeography, or the G. of animals (zoogeography) and of plants (phytogeography), the former including the study of mankind (anthropogeography), which is again divided into political and commercial G. according as the subject is treated from the point of view of the gov. or commerce of the country in question. The discussion of the relation of man to his environment is also known to-day as economic G., and the accepted basis upon which to found such discussion is a knowledge of the structure or 'build' of a country (*see below*). The elucidation of the many questions involved in the foregoing divs. leads to a study of the processes by which the present situations have arisen, which is termed historical G. or paleogeography, a distinct subject from the hist. of G., which

application of geographical study to a limited area, and in its turn leads to topography, the description of a special place or locality. For fuller information relating to any of these special branches the reader is referred to the various articles and to the books mentioned in the bibliography below.

Economic Geography and the 'Build' or Structure of a Country.—It is remarked above that a knowledge of the structure or build of a country is the best basis for discussing economic G. 'Build' is defined by Prof. Griffith Taylor as the essential geological pattern, whether anct. shield, crustal trough (syncline), or ridge (anticline), raised relic of an old range or young mt., either with broad or narrow folds. This aspect of G. has been presented in the better text-books in Europe since 1910, but is by no means universally

adopted in America. Its chief advantage, however, is that it enables us to account for the distributions of various commodities such as metals, coal, oil, or water-supply in a way impossible by any method which ignores structure. A study of structure or build shows, for example, that erosion is much more rapid on the exposed surfaces or mts. and plateaux, with their swift rvs. and streams eating into the steep slopes, and that it is only when such land-forms are worn down to their root to form penepelains that they become relatively stable. It tells us, too, that the most permanent portions of the earth's crust are the very anct. land-surfaces known as coigns or shields. These shields flank the Atlantic and Arctic oceans, while the greatest elevations of today flank the Pacific and Indian oceans, and the most important shields occur in Brazil, E. Canada (the Laurentian), E. Siberia (Angara), Russia, and W. Africa. Many geologists believe that the tetrahedral earth-plan is a rollo from the original cooling and contraction of the molten earth, and certainly the tetrahedral theory affords some explanation of the world-plan—the central Asiatic land-mass with the three great continental 'peninsulas,' America to the S.E., Euro-Africa to the N.E., and Australasia to the N.W. (as shown on a form of polar projection with the N. Pole at the centre). The climatic arrangements of the world-plan are determined primarily by lat. and secondly by aspect. A study of the arrangement of the vegetation in the Amer. 'peninsula' shows that it is identical with that in Africa, except that the gulf of Mexico and the Caribbean Sea have very deeply embayed America on the tropic of Cancer. Again such study serves to explain the remarkable monsoon climate for which India is noted; and again why there is always a belt of warm temperate forest and savannah about 500 m. wide on the E. or windward side of the desert belt which stretches from the Sahara almost to China. Early man, says Prof. Griffith Taylor, 'had no greater love for the desert or tundra than the average man of to-day. Hence his chief abiding places would be found in the belt between the desert and the forests. The park-land type of country, just on the drier edge of the forests, would seem to be best suited to early man. Probably the primitive negroid peoples would prefer the warmer savanna woods, while the higher races would expand on the edge of the temperate forests. These belts would also be the great *corridors* of migration until man tamed cattle and horses, when the drier steppes would be equally available. With the use of bronze and iron tools, some progress would be made in cutting down the deciduous forests of the temperate zone, but as regards tropical forests, man has not even yet made much impression on them...'. These belts of vegetation have varied in position during the life of man on the earth. Every one knows of the swing from tropic to tropic of the sun during each half-year. The effect of this swing is first felt as a change of temp.

and this brings about a similar seasonal swing in the wind-belts and also in the rain-belts. There is thus a direct connection between the change in a temp. belt and the change in a rainfall belt.' (Griffith Taylor, *Environment, Race, and Migration*, a valuable work on the 'fundamentals of human distribution,' pub. by Toronto Univ. in 1937.) Consult also G. Taylor, 'Climatic Cycles and Evolution' in the *Geographical Review* for Dec. 1919; W. H. Hobbs, *Earth Evolution*, 1922; and J. Joly, *The Surface History of the Earth*, 1925.

While it is thus evident that G. as a branch of knowledge is capable of progressive div. into various subsections, each of which can be treated in itself, it is nevertheless necessary to point out that the tendency is rather towards unification. This is due to the influence of Peschel and Ritter in Germany, whose views have gradually made their worth felt also in England and America. While the old system of G. as taught in schools consisted simply in treating each portion of the globe with reference to its physical, political and commercial features quite objectively without any special scheme or order, the modern system endeavours to show the immediate or underlying connection each geographical fact has with the pupil himself. Hence it is customary to begin with those geographical features which intimately concern the pupil, such as the surroundings of the class-room, thence to deal with the immediate vicinity, and afterwards to enlarge the scope of the study until it deals with the characteristics and interrelation of the general features of the earth's surface and their influence on mankind and animal and plant life, leading on to the reasons for the distribution of mankind in tn. and country and to the study of geographical hist. This new system of dealing with the subject has given G. a place among the highest branches of knowledge, and many univs. now have special profs. of G., and grant degrees in the subject.

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For current information see *The Statesman's Year Book*, ed. by M. Epstein; *Whitaker's Almanack*; the *Almanach de Gotha* (pub. in Fr. and Ger.), as well as the Proceedings and Journals of the various geographical societies, notably the *Journal of the Royal Geographical Society*.

Geological Societies. The chief G. Society in Great Britain is the G. Society of London, founded in 1807 and incorporated in 1826 (address, Burlington House, London, W.1). Among foreign G. soc. some of the principal are the G. Society of America (New York), Société Géologique de France (Paris), Deut.-deutsche geologische Gesellschaft (Berlin), and the Società Geologica Italiana (Rome). International Congresses of geology are held at intervals, the first having taken place at Bologna in 1878. Much work of a f. nature is carried out by members of crystallographical, petrological, mineralogical, and paleontological societies, while smaller bodies (natural hist. soc. etc.) afford a focus for local activities.

Geological Survey. This institution, with its attendant museum, has had a complex origin and hist. The Geological Society of London, founded in 1807, was the first geological society in the world. It preceded the G. S. formed in 1835, and can, in fact, be credited largely with the

initiation of the idea. Its presidents have included such famous men as Murchison, Lyell, Sedgwick, Buckland; among its secretaries were de la Beche and Darwin. In its *Quarterly Journal* numerous contributions have become classics. Prof. Daly of Harvard, U.S.A., in speaking of it has said: 'Most of the fundamental and therefore endlessly stimulating ideas of geology were born in Britain, and before their golden worth was assured, each announcement of principle had to go through the purifying furnace of debate in the Geological Society of London.'

Following the formation of the London Geological Society similar organisations have sprung up in cities all over the world. Industries associated with geology have also their societies—as, for example, the Institute of Petroleum Technologists and the Institute of Mining and Metallurgy. Not all their members have been professional geologists, but men with a certain amount of leisure and a great amount of curiosity: Hutton, Lyell, Agassiz, and Darwin were amateurs; Murchison and de la Beche were originally soldiers. Medical men and schoolmasters, among others, were also keen members. The first officially instituted G. S. was that of Great Britain. Its emergence was largely due to the immensely valuable pioneer work of the London Geological Society and to the enlightened policy of Col. T. F. Colby (1784-1852), director-general of the Ordnance Survey. In 1834 Sir Henry de la Beche, at the direction of the Ordnance Survey, produced a geological map of Devon and in 1835 the G. S. was estab. as a subsidiary of the Ordnance Survey, with de la Beche, then foreign secretary of the London Geological Society, becoming director. G. S.s. of other countries were estab. later, and those of the U.S.A., Canada, Germany, and France have reached a high standard of efficiency.

The G. S. of Great Britain is not merely one centralised official body. It has a nucleus of at least fifty professional geologists with a staff of technical assistants, these in turn supported by a large background of amateur workers and investigators, generally organised into local and regional associations and field clubs. The purpose of the G. S. is to collect information regarding the rocks, minerals, and resources of Britain (including water supplies), to produce various types of maps and reports, and to give geological advice not only to the various gov. dep'ts. but also to any individual inquirer—the results of such work being pub. in the printed memoirs issued annually, and in the regional handbooks prepared from time to time, some account of which will be given later. In addition to the promotion of a growing mass of geological science the survey work is of great practical value in relation to agriculture, mining, road and railroad development, and the proper utilisation of natural resources, including water—a matter of steadily increasing importance.

Ancillary to all this a museum of economic geology was estab. in 1837, and

In 1851 the Museum of Practical Geology and the School of Mines were opened. For the purpose of co-ordinating the work of the G. S. with its visual illustration in the new museum the country was divided into a number of regions. To each of these regions one bay in the museum was allotted. So far as possible the regions were based on natural divs., but arbitrary boundaries were obviously necessary on account of limitations of space. Thus the area known as the Hampshire basin, although naturally divided from the Weald, was extended westwards and northwards to the boundaries fixed for adjoining regions. This area thus includes the whole of Dorset, the greater parts of Wiltshire and Hampshire, and the Isle of Wight. In this region are exposed all the formations in the Jurassic, Cretaceous, Eocene, and Oligocene systems, as well as a variety of superficial deposits. From the earliest days of geological investigation this area has been an attractive field—it's pleasing scenery, its holiday resorts, the economic value of many of the strata, and its abundant fossils have all been contributory factors to our knowledge. The quarrying of high-class Portland building stuc. &c. disclosed many fossil and interesting rock specimens. A small part of the area, a little tract on the Wiltshire border, near Bath, is of historic interest since it figures in the oldest geological map—that of the neighbourhood of Bath, pub. in 1799 by Wm. Smith, a surveyor, the 'father of English Geology.' In the early part of last century pioneers like de la Beche, Buckland, and Conybeare were investigating the strata of the Dorset coast and making known the remarkable fossils found there. Mary Anning, the daughter of a cabinet-maker of Lyme Regis, became famous for her work in collecting and developing the remains of Saurian reptiles in the Lias afterwards studied by Owen and other anatomists. She discovered the first complete skeleton of *Ichthyosaurus* recorded in this country, also a new Saurian reptile that is now the well-known *Plesiosaurus*, and the remains of a flying reptile.

In the second half of last century (from 1878 to 1886) the Lias ammonites were the subject of a monograph, pub. by the Palaeontographical Society, by Thomas Wright, a Cheltenham surgeon. In recent years detailed examination of the cliffs near Lyme Regis and Charnouth by Dr. W. D. Lang has provided some of the most exact results obtainable by modern methods on the study of fossils. The beds of Inferior Oolite in Dorset have been studied intensively by S. S. Buckman, who firmly estab. the value of ammonites in determining the exact geological age of minor divs. of strata and made interesting deductions as to the conditions under which the beds were deposited.

Plant remains found in the pipeclay in the cliffs near Bournemouth were long ago studied by the palae-botanists Ettingshausen and Starkie Gardner; while in recent years further critical researches on plant remains have added muc to our

knowledge. Beds of sev. ages in the Isle of Wight are well exposed in cliff faces.

The chalk occupies the greater part of the area included with the Hampshire basin. Prof. Charles Barrois of Lille was the first to show that the same zones estab. in France could be traced through England.

There are now in Great Britain dep'ts. for England and Wales, Scotland, and Ireland, acting under a director-general at headquarters in London, and the Ordnance and Geological Surveys, although collaborating, are distinct. What changes, if any, may arise from the recent declaration of an Irish republic are not yet known.

The G. S. issues coloured geological maps on the scale of 1 in. to 1 m. (1 in 63,360), 6 in. to 1 m. (1 in 10,560), and 25·344 in. to 1 m. (1 in 2500); there is also a special index map, on the scale of 4 m. to 1 in. Descriptions of the maps are pub. and the survey issues periodical memoirs describing the work done and containing the director's report—special reports being pub. regarding water supply. Detailed handbooks, with maps and photographs relevant to the work done in each of the sixteen regions, have been pub. for the Dept. of Scientific and Industrial Research by H.M.S.O., at the price of 1s. 6d. The latest ed. (1948), with additional photographs, is pub. at 2s. 6d. The U.S. G. S., organised in 1879, and with headquarters at Washington, D.C., is united with the topographical survey. Folios of maps are pub. on scales corresponding to those of Great Britain, containing topographical, orographical, economic, and geological charts. Bulletins are issued annually and special publs. are devoted to water resources. Special agronomic or soil maps are issued (as also in Japan and Germany before the Second World War) and great importance is attached to the collection of photographs and material for educational purposes. The surveys of other countries also issue annual reports (possibly interrupted during the Second World War), which may be purely scientific or of economic or statistical importance; while the colonial surveys pub. special reports regarding mining developments of the colony.

Much survey work is now carried on by aeroplane (e.g. for the Brit. Ordnance Survey), O. G. S. Crawford having emphasised the fact that many features (anc. earthquakes, etc.) can plainly be discovered in this way even when unnoticeable to an observer on the ground.

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Geology (Gk. γῆ, the earth, and λόγος, a discourse), the science which investigates the structure and hist. of the earth. It deals with the nature and origin of the

rocks which form the earth's crust, and treats of the progress of our planet from its earliest beginnings down to its present condition, of the birth of oceans and continental areas, of mutations of climate, and of the appearance and disappearance of successive faunas and floras. As an inductive science G. is comparatively young, although, as the writings of Pythagoras, Strabo, and others show, from very early times, the phenomena with which it deals claimed some attention. The belief of oriental cosmogonies in the alternate destruction and renovation of the world, may well have been caused by the observation of the occurrence of sea shells in rocks far removed from the sea. In the tenth century fossil shells were regarded as evidence of geographical changes, although some held that they were the result of 'plastic force' or were special creations. That they were relics of the Noachian deluge was an idea which prevailed throughout the seventeenth and eighteenth centuries. The philosophers on the Continent, Palissy (1580), Leibnitz (1680), Moro, and Generelli (1740), and others held advanced views and had propounded theories which are now fundamental. Especially in Italy did the science progress, and in England the spread of these advanced views is shown by the pub. of J. Michell's *Cause and Phenomena of Earthquakes*, 1760. The eminent prof. of mineralogy at Freiburg, A. G. Werner, had in 1775 determined the order of succession of the strata in the Harz Mts. He maintained that his classification was applicable to the sedimentary strata of the whole world, and although this was found to be inadequate, and in some respects erroneous, it nevertheless estab. a definite geological principle. Werner regarded the igneous rocks as chemical precipitates, James Hutton (1788) upheld the igneous origin of these rocks, and a great controversy arose between the 'Wernerites,' or 'Neptunists' as they were termed, and the followers of Hutton, the 'Vulcanists.' The latter hold that the records of the past were only to be interpreted by understanding the methods of nature at the present. The Huttonian theory was ably expounded by John Playfair (1832) in his now famous *Illustrations*, and was also strongly supported by the experimental researches of Sir James Hall. Hutton's work had been done on the Scottish rocks, which were mainly igneous, and which, while showing excellently the effects of denudation and decay, were devoid of stratification. It was left to Wm. Smith (1790), an Eng. land surveyor working in the neighbourhood of Bath, to lay the foundations of stratigraphical G. Smith remarked that each group of the stratified rocks which came under his observation was characterised by its contained fossil remains. By thus establishing the fundamental geological principle, that rocks in different localities and possibly laid down under different geographical conditions can be correlated in time by the use of fossils, Smith gained for himself the title of 'the Father of Geology.' Charles Lyell held Huttonian ideas, and his *Principles of*

Geology (1830-33) is still a standard work of reference. The cry that the present is the type of all preceding ages, as far as is revealed by the fossiliferous strata, gained for his school the name 'Uniformitarian.' The pub. of Charles Darwin's *Origin of Species*, (1859), as well as affecting the palaeontological side of the science gave an evolutional tinge to the physical and stratigraphical side. The attention given to the petrographical side of G. was revived



TALUS FORMED BY ACTION OF FROST,
NIPIGON RIVER, ONTARIO

by the researches of Henry Clifton Sorby (1826-1908), who showed that much information was to be obtained from the examination of thin sections of the rocks under the microscope, and thus opened up a field of inquiry from which much has been gleaned and from which more may be expected. The sci. depts. of G. may now be outlined.

Geognosy.—This treats of the materials of which the planet consists, and is sometimes treated under the name Petrology (q.v.), of which Petrography and Petrogenesis are the two branches. The earth consists of a globe having a cool and solid crust, but with a high internal temp., and surrounded by two outer coverings or envelopes, an outer one of gas (atmosphere) and an inner one of water (hydrosphere). The atmosphere extends some 500 m. from the earth's surface, while the hydrosphere with an average depth of about 14,000 ft. covers about three-fourths of the surface of the globe. The solid crust or lithosphere has a mean density of 2.7, and since the density of the earth as a whole is 5.6, the inference drawn is that the planet consists of two portions—a lighter solid crust and a heavier interior (barysphere). The evidence for the internal heat of the globe

lies in the existence of volcanoes, hot springs, and the downward increase of temp in borings, wells, and mines. Below a zone of invariable temp., the temp rises on an average of 1° F. for every 60 ft. of descent. Inferring this increase continuous, the most intractable bodies would be come molten at a depth of 50 m., and thus the theory was held that the earth had a molten interior surrounded by a solid crust. The impossibility of this condition was shown by Prof. Hopkins of Cambridge while Lord Kelvin showed that the earth is more rigid than a ball of steel of the same diameter and argued that it was probably solid to the centre. The solidity of the interior is accounted for by the suggestion that fusion of the rocks by the intense heat is prevented by the enormous pressure which exists at the depth. In any event, the rigidity of the barysphere is beyond doubt and its mean density must clearly be greater than 5.6. There is reason to

tion of the past. Thus the records of the past action of various natural agents of change, as preserved to us in the rocks of the earth's crust, may be interpreted by the study of the operations of nature now in progress which study constitutes dynamical Geology. The agencies of geological change are divided into two main groups (i) Epigene or Subaerial, (ii) Hypogene or Subterranean. The subaerial agencies may be subdivided as atmospheric, aqueous, organic, and chemical. The winds of the atmosphere are concerned in the removal from one place to another of all loose material. In this way we get the formation of sand dunes and links, and the curious clay formation 'loess'. Changes of temp causing alternate expansion and contraction of the rocks result in their ultimate destruction. The aqueous agencies of change are the most important of epigene agents. The rain washes away fragments of disintegrated rocks into the



UNDERGROUND WATERS

Water and rain an infiltrating soil sink into the soil until arrested by some impermeable bed such as clay or shale. The level of ground water rises after a wet season and sinks after a dry one, leaving shallow wells without a water supply. Springs occur at the sides of slopes where the top of the impermeable layer is exposed.

believe that it consists chiefly of a mixture of nickel and iron, though town is its periphery there may be a zone of metallic sulphides and oxides. The lithosphere down to a depth of 10 in. consists mainly of oxygen (about 47 per cent) and silicon (about 27 per cent) in the form of silicates, etc. The age of the earth has been estimated from the thickness of the stratified deposits. From observation of the rates of geological changes at the present as summing them in a measure of past changes and taking the maximum thickness of the sedimentary strata to be about 530 000 ft., geologists have calculated the age of the planet to be over 300 000 000 years. Lord Kelvin from physical arguments assigned at least 100 000 000 whilst more recently, from radiometric considerations, the age has been estimated at some 2 000 000 000 years. This result has been confirmed astronomically. The rocks of the earth's crust may be subdivided into three main groups, viz. Aqueous, Igneous and Metamorphic. The composition of the rocks and their macroscopic and microscopic characters are treated under Petrography, while the study of Mineralogy treats of the mineral constituents.

Dynamical Geology — Geologists believe in the constancy of nature and consider that the study of the present order of nature provides a key for the interpreta-

tion of the past. Continual weathering of the rocks by rain causes the surface of the land to be worn down and the material transported to the sea. Rain water percolating the rocks is assisted in their destruction by frost. The water is frozen in cracks and crevices and by the expansive force the rocks are shattered into fragments. Especially does this occur on mountain tops, giving rise to jagged peaks whose slopes are covered by a 'talus' of shattered fragments. Springs may arise from the rain which falls on previous strata and may issue as perennial or intermittent or as cold or thermal springs. Occasionally spring water holds minerals in solution and may deposit the excess locally as calcareous travertine, or as siliceous sinter. Owing to underground waters dissolving and wearing away the rock, caves are formed in which we may find stalactites and stalagmites. Streams and rivers are concerned in the work of denudation by eroding their beds, transporting the material swept into them by rains and floods, and by the deposition of this material in places where the waters come to rest. Thus lakes may be silted up and deltas and alluvial flats formed. Glaciers show the work of frozen water. By carrying off rock material as 'moraine' and by carving valleys out of rocks, they assist in the work of denudation. The waters of the sea act

in three ways: by erosion, transportation, and deposition of sediment. Waves and breakers erode the shore, and this material together with that brought down by rivers, is carried by ocean currents, and finally deposited on the ocean floor within about 200 m. of the shore-line. The organic agencies at work are those depending on plant and animal life. Plants by their growth and decay continually add to the soil and also protect the rock surface. Carbonaceous and coaly deposits are formed by plants, and also siliceous deposits, such as the diatom ooze on the ocean floor. Animals aid in the building up of the earth crust by adding their coverings or skeletons. Thus are formed globigerina and radiolarian oozes, and the coral is. reefs. Finally, chemical agencies are concerned in cementing loose deposits into solid rocks, in forming littoral concretes and deposits of calc-sinter, and in giving origin to mineral oils and rock salt. The hypogene agents of change are volcanoes, earthquakes, and slow crust movements. These agencies are engaged in accentuating the relief of the globe, and act antagonistically to the levelling tendency of epigene agents. The volcano piles up masses of *volcanic cuestas*, the earthquake shakes entire districts, while the secular crust movements warp the crust into vast regional waves of alternate elevation and depression, or give rise to mt. ranges. Thus the two sets of agencies, epigene and hypogene, keep the earth in habitable equilibrium; the ruins of the lands deposited as sediments on the ocean floor by the one being raised above the surface of the ocean by the other, to undergo the same sequence of degradation, deposition, and renewal.

Geotectonic geology deals with the structure of rock masses. Viewing first the igneous rocks, we find they are grouped as (a) extrusive, and (b) intrusive. The former type are chiefly lavas and ashes, ejected near the surface. Lavas have a scoriaeous upper and lower surface, vary in thickness, and produce a certain amount of contact metamorphism on the underlying beds. Steam holes or vesicles in the lava may become filled by secondary mineral matter giving amygdaloidal structure. The ashes exuded from volcanic cones vary in coarseness from fine dust and tuff to agglomerate formed within the cone from bombs and lapilli. The intrusive types of igneous rock are newer in age than the rocks into which they are intruded, and are represented by volcanic necks, dykes, bosses, laccolites, and intrusive sheets or sills. These latter differ from an extruded lava sheet in having no scoriaeous surfaces, not varying so markedly in thickness, and having rocks both above and below altered by contact metamorphism. Regarding now the secondary or derivative rocks, we observe their characteristic bedding or stratification due to the method of accumulation, i.e. by deposition under water. Individual beds when followed are found to be wedge-shaped, i.e. they thin out. Followed laterally, a bed may change its character, e.g. limestone passes into shale, shale into sandstone, and

sandstone to conglomerate. If the strata are horizontal, then the beds outcrop parallel to the contour lines. This is not always so, but the beds generally dip at a certain angle due to folding. The strike of a bed is at right angles to the true dip, and is designated by the compass bearing. The beds are folded into anticlines and synclines due to crust movements. In int. regions where the tangential pressure appears to be greatest, the beds are often overfolded and inverted, giving the type of folding known as isoclinal. In the Alps and mt. chains of similar type, such as the Himalayas and the Andes, the folding and



PART OF FOLDING MOUNTAIN, ATHABASCA GAP, ROCKY MOUNTAINS, SHOWING A COMPLEX SYNCLINE

inversion is so great that a typical fan structure is developed. Jointing occurs in both sedimentary and igneous rocks, smaller joints being due to drying and contraction of sediment in the aqueous rocks, or to cooling and contraction in igneous rocks. Master joints, due to torsional stresses, traverse both igneous and aqueous rocks, when followed across country. Faulting or dislocation of the beds is also due to earth movement and pressure. Evidence goes to show that these disturbances have occurred over and over again, beds being upheaved, folded, tilted, and denuded, and then being depressed, and sediment deposited upon the denuded surface, giving rise to unconformities.

Palaeontological geology deals with fossils or organic remains preserved in the rocks and endeavours to gather information from them as to the hist. of the earth and its inhabts. Fossils are of great use in determining the age of strata, and given that the type fossils of a formation are known, it is possible to show the existence of any break which occurs in the stratigraphical succession, or any abnormal sequence which may occur as the result of folding. From the study of the fossils it can be shown that the progress of life forms has not advanced at the same rate in all quarters of the globe, a certain stage being reached in one place many thousands of years before it was reached in another part of the globe, although the same general succession of organic types may be found in each region. The testimony of the rocks is in favour of the doctrine of evolution, although very many discrepancies arise owing to the imperfection of the geological record.

Historical Geology.—The fossiliferous strata of the S. of England were the first strata to attract minute study. Following on his researches on these strata, and

on other rocks in England and Wales, Wm. Smith pub. a table of the stratigraphical succession, in which the London clay was regarded as the top series, passing downwards into the Chalk, Greensand, Oolite, Lias, New Red Sandstone, Coal Measures, Old Red Sandstone, and the Greywacké Rocks. In later years these Greywacké rocks were investigated by Murchison and Sedgwick. Sedgwick, working from the base of these old rocks, called his system the Cambrian, while Murchison, working from the base of the Old Red Sandstone, named his system the Silurian. Later it was found that the Upper Cambrian of Sedgwick was the same as Murchison's Lower Silurian, and it was suggested by Prof. Lapworth that they be grouped as Ordovician. Rocks older than Cambrian are unfossiliferous, save for the pseudo-fossil *Eozoon canadense*, and are termed pre-Cambrian. Sev. alterations were made in the upper part of Wm. Smith's classification. The newer rocks, the Tertiary, were subdivided by Lyell into Eocene, Miocene, and Pliocene, according to their percentage of living types of mollusca. Since then the groups Oligocene and Pleistocene have been added. The Old Red "can." no below the carboniferous system was studied and their fossil fishes described by Hugh Miller and Agassiz. The Devonian strata of Lonsdale were found to be homotaxial with the Old Red Sandstone, certain fish and crustaceans being common to the two sets of strata, and thus beds of marine and fresh-water origin were found to have been deposited during the same geological period. The 'New Red' rocks were divided, at a later date, into the Permian and the Trias. As accepted at the present day the schema of chronological classification is as follows:

Quaternary or Anthropozoic	(Recent and Pre-historic Pleistocene)
Tertiary or Kainozoic	(Pliocene Miocene Oligocene Eocene)
Secondary or Mesozoic	(Cretaceous Jurassic Triassic)
Primary or Palaeozoic	(Permian Carboniferous Devonian Silurian Ordovician Cambrian)
Archæan	pre-Cambrian

The Kainozoic group is sometimes divided merely into Neogene and Palæogene, whilst the Mesozoic and Kainozoic groups are spoken of collectively as the Neozoic, and the Palæozoic is occasionally divided into the Protozoic (Cambrian, Ordovician, and Silurian) and the Deuterozoic (Devonian, Carboniferous, and Permian). This Brit. schema is followed in more or less detail by geologists of all

countries, and formations of other lands can be arranged approximately under Brit. types.

Petrology.—This div. of the science has rapidly become one of the most important. Of its two branches, petrography deals with the study of rocks as they are, while petrogenesis is concerned with the modes of origin of rocks. Modern petrological methods are largely chemical or physico-chemical, while microscopic examination of rock-sections is an essential part of the technique. In England the igneous rocks have been classified according to their crystalline character into Plutonic, Hypabyssal, and Volcanic. In America, however, the rocks are classified according to their chemical composition. The nomenclature is somewhat complicated, but much may be expected from the careful analysis of the rocks. For further treatment see PETROLOGY.

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Geomagnetism. the earth's action as a magnet. The effective and practical study of G. in England is closely associated with the name of Edmund (or Edmund) Halley (q.v.) the astronomer, though the attraction of iron by loadstone was known to antiquity, and is mentioned by Plato and later writers. In our time the study has been pursued by Crichton Mitchell, and, before him, by Hellmann and Sylvanus Thompson. While still at St. Paul's School Halley decided to devote his life to astronomy, but G. was his chosen secondary interest. In 1672, when only sixteen years of age, he measured the magnetic declination in London. At Oxford he planned an expedition across the equator to observe the S. stars and, in 1676, he was enabled, through the Royal Society, to go to St. Helena, where he observed the declination. The Royal Society pub. his famous theory of the distribution of the declination in 1683. Halley's aim was 'to reconcile the observations by some general rule,' not, as Descartes did, by 'causes altogether uncertain' (as are the casual lying of iron mines and loadstones in the earth), 'which,' he thought, 'put a stop to all further contemplation.' His conclusion was that 'the whole earth is one great magnet, having four magnetic poles, or points of attraction, near each pole of the equator two, and that, in those parts of the world which lie near adjacent to any one of these magnetic poles, the needle is governed thereby, the nearest pole being always predominant over the more remote.' In 1691 he extended his theory to explain the secular variation, the whole period of which he conjectured to be '700 years or thereabouts,' but he expressly left the 'nice determination of this and other particulars in the magnetic system,' to be resolved by remote posterity. We now know that, despite the irregular distribution of the earth's magnetic field, there are only two magnetic poles, to which converge all the magnetic meridians, and Halley's own later knowledge would have enabled him to draw many of these meridians, and to discover the

fact. The first actual chart of the earth's magnetic meridians was made in 1817 by Thomas Yeates. The 'irregularities of the earth's field imply a more detailed irregularity in the inner causes than Halley's hypothesis suggested, and the secular variations are regional in character, not so regular and world-wide as he supposed' (S. Chapman). The causes of the main field, of its irregularities, and of its secular variations are still unknown. In 1698 Halley was granted a ship by William III, 'to improve the knowledge of the longitude and variations of the compass.' After a magnetic survey of the N. and S. Atlantic he returned in 1700, and next year pub. his first chart of the declination over the Atlantic. In 1702, having collected further observations by mariners in other oceans, he produced a world magnetic chart. These charts are his greatest contributions to G., and give the declination in a way very convenient to navigators. In time, as he foresaw, their practical value came to an end, owing to the secular magnetic variation, but the value of his observations as a record of the declination at the epoch 1700 remains unimpaired. One remarkable gap in his geomagnetic work was his apparent total neglect of the magnetic dip, and this in spite of the importance then already given by Wm Gilbert to the phenomenon. For two centuries, says Prof. Chapman, Halley had no comparable successor in this sphere, and the magnetic survey of the globe was not renewed with his zeal until in 1905 a young Amer., Louis Bauer, with the support of Carnegie, resumed the task. See also MAGNETISM. See G. Heilmann, *Zur Geschichte der Erdkunde*, 1897; A. Crichton-Mitchell, *Terrrestrial Magnetism*, 1932; *Correspondence and Papers of Edmund Halley* (together with an unpublished memoir by one of his contemporaries), ed. by E. F. MacPike, 1932; and S. Chapman, 'Edmund Halley and Geomagnetism' in *Nature*, Aug. 28, 1943.

Geometric Mean, middle of three quantities which are in geometrical progression (q.v.). Thus, if a, x, b are in geometrical progression, x is the G. M. between a and b . From the definition of geometrical progression it follows that $x = \sqrt[a-b]{ab}$ and $x = \sqrt[a-b]{ab}$. In higher mathematics the definition is extended so that the G. M. of n quantities is the n th root of the product of the quantities. Thus the G. M. of $a_1, a_2, a_3, a_4, \dots, a_n$ is $\sqrt[n]{a_1 a_2 a_3 \dots a_n}$. The G. M. of two quantities is also their mean proportional.

Geometric Progression, series of quantities such that the ratio of any one of them to the one immediately preceding is the same throughout the series. This ratio is called the common ratio of the series. Thus 3, 6, 12, 24 . . . etc.; 6, -2, 1, -8, . . . etc., and a, ar, ar^2, ar^3, \dots , etc., are series in G. P. whose common ratios are respectively 2, -4, and r . In the last series the n th term is ar^{n-1} and the sum of n terms is $a \times \frac{1-r^n}{1-r}$. In cases where r is

less than 1, it is found that the sum of an infinite number of terms of the series is the finite quantity $\frac{a}{1-r}$. A recurring decimal

is an example of such a G. P., and is hence reduced to its equivalent fraction. G. P. forms the basis on which calculations of annuities and compound interest are made.

Geometries, Finite. Name given a class of (s.), in each of which there is a finite number of elements called *points*, falling into subsets called *lines*. The mutual relations between lines and points are closely analogous to those of lines and objects in ordinary projective geometry. See O. Veblen and J. W. Young, *Projective Geometry*, vol. 1., 1910, vol. 2, 1918, Boston, U.S.A.

Geometry may be defined as the investigation of the properties of space.

Historical.—As the name implies, its origin may be traced to what was necessary for the management of land. The frequent inundations of the Nile in Egypt destroyed landmarks, and so altered the value of land that the priests were driven to invent some method for finding areas. The first known attempt to classify these results was by a priest Ahmes in the 'Rhind' papyrus, which is at present in the Brit. Museum. Ahmes was the first geometer to give deductive proofs, and this work was continued by Pythagoras. Euclid (285 B.C.), though himself not so great a mathematician as some of his less known contemporaries, collected and arranged in a logical order in his *Elements* all the known theorems, and his work, with few alterations, has remained to the present day. Apollonius (217 B.C.) did much towards the investigation of the sections of a cone, and amongst those whose names stand out in the early hist. of the subject may also be mentioned Archytas, Plato, and Archimedes, and somewhat later Menelaus and Ptolemy, though it is probable that some famous propositions now ascribed to them were previously known. Much time of the early geometers was spent in famous problems such as the quadrature of the circle, the duplication of the cube, and the trisection of an angle. In more recent times the further development of the subject attracted the attention of eminent mathematicians whose names are too numerous to mention here. It may be remarked that analytical methods were introduced and developed by Descartes in the fifteenth century; and as astronomy became more thoroughly studied the geometry of spherical triangles was introduced.

The subject is best discussed under two main heads— Pure and Analytical.

PURE GEOMETRY in its turn naturally divides into two parts, Elementary and Higher.

(1) **Elementary.**—Pure G. embraces roughly the ground covered by Euclid's *Elements*, which forms an ordinary school course in plane and solid G. The latter treats of the ordinary space in which we move and is termed three-dimensional. A plane is two-dimensional, the upward direction out of the plane or third dimension being lost. Similarly, a line is of one

dimension, the direction sideways out of the line, in addition, being lost. A point has no dimensions. The terms length, breadth, and thickness are popularly ascribed to the three dimensions. The conception of some unknown fourth dimension has occupied much attention, but that is hardly within the scope of the present discussion. It is sufficient to say that the algebraical methods of analytical G. can be applied to some extent to problems in four dimensions. Euclid's *Elements* filled thirteen books, of which numbers VII. to X., dealing with arithmetical and irrational quantities and parts of XI., XII., XIII., dealing generally with solid G., are not usually read. Of the rest, Book I. deals with lines and angles, finishing with certain propositions on areas; Book II. deals entirely with the areas of squares and rectangles; Book III. with circles; Book IV. with polygons; Book V. is an introduction on proportion to Book VI., which deals with ratios. The retained parts of Books XI. and XII. deal with elementary properties of solid G. The whole series of propositions is based on certain assumptions and definitions. Euclid divided the assumptions into two parts. The first part contained what are now known as axioms 1 to 9; the second part, axioms 10 to 12 and the three postulates. An *axiom* may be defined as a self-evident truth, incapable of proof, which serves as a basis for future reasoning. Without some such assumptions, no G. is possible, but there is much doubt as to exactly what may be justifiably assumed. Euclid has been criticised for making further assumptions in his propositions which are not mentioned initially in his list, and for mixing certain axioms with his definitions. What is now the twelfth axiom, in particular, on which proof of theorems on parallel lines are based, is unsatisfactory, and in most modern eds. has been replaced by what is known as Playfair's axiom, but this, though more fundamental, is still open to some objections. The present method is to divide the assumptions into axioms and *postulates*, the latter being what must be necessarily assumed in construction, but it is questionable whether this is an improvement or not.

Until the beginning of the century the selected part of Euclid's *Elements* was accepted universally in almost its original form as a school text-book, and although it is not used now, those at present in use are little more than revised eds. A few propositions have been entirely omitted, the order has been altered in places, and some new methods have been introduced. There is no doubt that the alterations constitute a definite improvement. The new methods are worthy of notice. The idea of a locus is introduced, that is, of the path of a moving point. A circle is defined as 'the figure enclosed by a line traced out by a point which moves in such a way as to be always a given distance from a certain fixed point.' The principle of applying one figure to another is extended, and the *hypothetical construction* is introduced. It is assumed as axiomatic that a perpendicular can be drawn on a line from a point

within it, a finite straight line bisected at a point, and an angle bisected by a straight line, whereas Euclid never used any one of these for a proof until he had found a method for its construction. The order of his propositions suffers in consequence, and some proofs are unnecessarily long. Thus Euclid, I. 5, the proposition known as the *Pons asinorum*, because its length made it a serious difficulty presented to the beginner, is now comparatively simple.

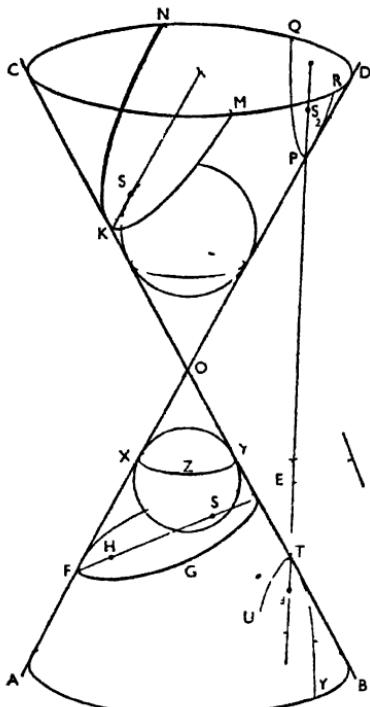


FIG. 1 CONICS

Mention may be made of the method of proof known as the *Reductio ad absurdum* which Euclid used often and is still retained. It occurs principally in converse propositions but it is not confined to these. In such a proof what is to be proved is assumed wrong and an obvious absurdity deduced. This absurdity occurs in every case but the one to be proved, and hence the proof is established.

Euclid's solid Ω is of a very elementary nature, and is confined to a few propositions on planes and lines (which follow at once from the methods of plane Ω), and on simple solids, including the five regular polyhedra. It is obviously impossible to deal with the propositions in detail here, and the student must be referred to the many school text books.

(2) *Higher Pure Geometry* — On finishing the ordinary school course the student is usually introduced to the *conic section*, and though these curves are generally best treated by the methods of projective geometry a description here is advisable. As the name implies, they are the curves obtained by cutting a right circular cone by planes. When the cutting plane makes an angle with the horizon less than that made by a generating line (AD and BC are called *generating lines*) the resulting curve is called an ellipse (in the figure EGF). When the cutting plane is parallel to a generating line, the curve is a parabola (NKM in the figure), and when it makes a greater angle with the horizon, the curve is an hyperbola (PQR and ULY in the figure). It is best explained here that the geometrical conception of a cone differs from the popular conception in that it is produced on the other side of the vertex O . Hence there are always two branches of an hyperbola. A particular form of hyperbola is two straight lines when the cutting plane passes through O . Similarly, a circle is a particular case of an ellipse. A sphere may be inscribed in the cone to touch the plane of the ellipse at the point S (called the *focus*) and it may be proved that any point on the ellipse is such that its distance from S is in a fixed ratio to its distance from the straight line l (called the *directrix* (the intersection of the planes LHG and XYZ)). The same is true for a second focus H , where another inscribed sphere touches the planes from below. The two foci of the hyperbola S_1 and S_2 , and the one of the parabola may be similarly found, and the same properties are true for these points. Thus a conic may also be defined as the locus of a point which moves so that its distance from a fixed point bears a constant ratio to its distance from a fixed straight line, the cone being an ellipse, parabola, or hyperbola according as the ratio is less than, equal to, or greater than unity. The point midway between the two foci of an ellipse

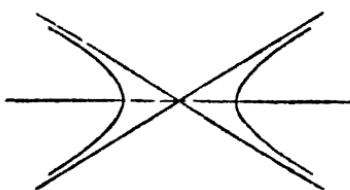


FIG. 2 ASYMPTOTES

or an hyperbola is called the *centre*, and these two are known as *central conics*. The extreme importance of the geometrical properties of these curves may be gathered on realising that comets, planets, and satellites move in orbits which are conic sections. Further, apart from questions of friction with the air, any body freely projected from the earth moves in a parabolic path. It may be mentioned also that as an hyperbola recedes from the centre it gradually approaches two lines known as its *asymptotes*, which pass

through the centre and are tangents to the curve at points infinitely distant (Fig. 2). Most properties of conics may be conveniently obtained by projective methods.

Projective geometry introduces many new ideas and conceptions not met with in Euclid, though it may generally be described as Euclidean. In particular Euclid never deals with infinity. Straight lines

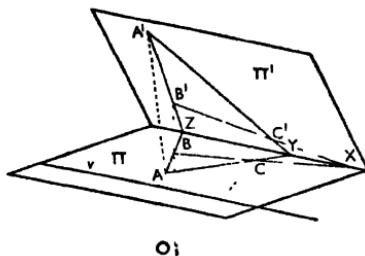


FIG. 3. PROJECTION

and planes in projective methods are regarded as extending to l^{∞} and v^{∞} , parallel lines and planes to meet at infinity, all points infinitely distant on a plane to lie on the line at infinity, and so on. These conceptions are principally due to Desargues and Poncelet. Projection itself is best explained from a figure. Let ABC (Fig. 3) be a triangle in a plane π , and O any point outside the plane. Then if OA, OB, OC are joined and produced to meet any other plane π' at A' , B' , and C' , $A'B'C'$ is said to be the projection of ABC. The figures $A'B'C'$ and $A'B'C'D'$ are said to be in perspective, and A , A' ; B , B' , etc., are pairs of corresponding points. If OAA' were to revolve about O, the points A and A' still remaining in the planes π and π' respectively, until it occupies a position parallel to BC, then A' will take up a definite position I' on the line $B'C'$ on the plane π' , and A will have moved off to an infinite distance on the plane π . The point I' is called the vanishing point of the line $B'C'$. In a similar way there is a line v in the plane π such that the plane of the line v and the point O is parallel to the plane π' . The projection of v on π' is infinitely distant, and v is called the vanishing line of the plane π . It is clearly parallel to XYZ, the intersection of the planes π and π' . It will be seen that AB , $A'B'$, and other pairs of corresponding lines intersect on the line of intersection of the planes. If ABC were projected from another centre O_1 into $A_1B_1C_1$, then $A_1B_1C_1$ and $A_1B_1C_1$ are said to be homologous. The method of projection from a centre O is known as central projection, in contrast to orthogonal projection, where the projection of a figure on any given plane is obtained by joining the feet of the perpendiculars drawn from all points of the original figure to the plane.

Projective G. can only be developed through properties which are capable of projection. In the ordinary way a magnitude alters by projection, and hence the

B, C, and D on a line constitute a range. Lines drawn to them from some point O outside the line are called rays, and any number of rays through a point constitute great majority of Euclid's propositions which deal with magnitudes are not, in the form in which they are given at any rate, adapted to projective methods. Propositions dealing especially with the idea of magnitude are termed metrical, whilst those which deal with the position of points in a figure and do not involve the idea of measurement or quantity are termed descriptive (all descriptive properties are projective). Certain metrical propositions, however, are capable of taking a form which enables them to be treated in projective G. It is necessary first to consider a new conception of magnitudes. If A and B are two points on a line, it is considered that $AB = -BA$ or $AB + BA = 0$. For three points A, B, and C, $AB + BC + CA = 0$, and so on. Four points, A, a pencil. The ratio $\frac{AC - AD}{BCBD}$, written $(ABCD)$, is known as the anharmonic ratio of A, B, C, and D. The four letters may be rearranged in twenty-four different ways, so that there are twenty-four different ratios; but these are alike in sets of four, and there are only six different values, which are all connected with the original one. If $(ABCD) = \lambda$, then $(ABDC) = 1 - \lambda$, $(ACDB) = \frac{1}{1 - \lambda}$, $(ADCB) = \frac{\lambda}{1 - \lambda}$, and $(ADBC) = \frac{\lambda - 1}{1}$. If $(ABCD) = 1$, then the range is said to be harmonic. From the relation $\frac{AC}{BC} = \frac{-AD}{BD}$

It may be seen that C and D divide AB internally and externally in the same ratio; as D moves further and further from the end of the line, so C moves nearer to the middle point, and in particular the middle point of AB is the harmonic conjugate of the point at infinity on the line AB (C

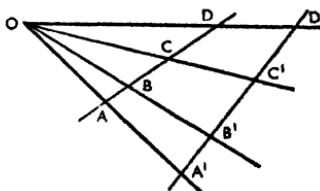


FIG. 4. HARMONIC CONJUGATES

and D being termed harmonic conjugates with reference to AB). It may easily be proved that if $A'B'C'D'$ is the projection of ABCD (Fig. 4), then $(ABC'D') = (A'B'C'D')$, and in particular, if $(ABCD)$ is harmonic, then $(A'B'C'D')$ is harmonic, $O(ABC'D')$ as it is written is then called an harmonic pencil. Hence it is seen that those metrical properties which are an harmonic are projective. From Fig. 1 it may be seen that by taking the vertex of

the cone as the centre of projection, and by suitably choosing the plane of projection, a conic may be projected into a circle; hence all harmonic properties of the circle give immediately the same harmonic properties for the conic. Descriptive properties of the circle allow of the same extension.

An example will best illustrate the principle. The pencil formed by joining

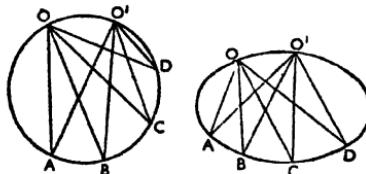


FIG. 5. HARMONIC PENCILS

any number (say four) of points A, B, C, and D (Fig. 5) to any other point O on the circle is equal to the pencil $O'(ABCD)$, where O' is any other point on the circle; since the angles subtended by the arcs AH , BC , CD at O and O' are equal. Hence by projection the pencil $O(ABCD) = O'(ABCD)$ for the ellipse. In a similar way the converse proposition may be established: that if two pencils of different centres, in the same plane and not in perspective, are projective (that is, can both be obtained from one figure by projection from two different points), the locus of the intersection of corresponding rays is a conic section. It may also be proved that when two ranges in the same plane, not collinear and not in perspective, are projective with one another, the lines joining corresponding points all touch a conic. The similarity between these two propositions suggests a further discussion on the Principle of Duality. A figure in projective G . may be considered to be generated by a point or a straight line in a plane; and a point or a plane in three dimensions. Thus a plane curve may be the locus of a point, or the envelope of a straight line (that is, the line in every position touches the curve). Propositions, therefore, occur in pairs. The following are series of parallel propositions:

Four points, A, B, C, and D, no three of which are collinear, are said to be the vertices of a complete quadrangle, and they may be joined in pairs by six sides. E, F, G are termed diagonal points.

It is proved that if FG intersects DC in H, then (EHDC) is an harmonic range.

The three pairs of opposite sides of a complete quadrangle are cut by any transversal in three pairs of corresponding points of an involution (q.v.).

Four lines a , b , c , and d , no three of which are concurrent, are said to be the sides of a complete quadrilateral, and they intersect in pairs in six points called vertices, e , f , g are termed diagonal lines.

It is proved that if h is the line joining the points of intersection of f , g , and c and h , then (ehdc) forms an harmonic pencil.

The rays which join any point to the three pairs of opposite vertices of a complete quadrilateral are pairs of corresponding rays of an involution pencil.

The properties of a series of points A, A^1, B, B^1, \dots , on a line in involution are discussed elsewhere. A similar correspondence between pairs of propositions is seen in the Theory of Pole and Polar and Reciprocation. The polar of a point with respect to a conic may be defined as the locus of the intersection of pairs of tangents at the ends of any chord through the point. The point is called the pole, in reference to the polar. When the point is outside the conic, the polar is the chord of contact of the two tangents drawn to the conic. In the case of a circle the polar is a straight line drawn perpendicular to the radius through the inverse point (see Inversion). It is proved that any line through the pole is cut harmonically by the circle and the polar, and hence poles and polars are projective. Thus all such properties for the circle follow immediately, by projection, for the conic. If a certain figure is made up of points x, y, z, \dots and lines a, b, c, \dots , the reciprocal figure is formed with respect to any conic, known as the base conic, by forming x, y, z, \dots the polars of x, y, z, \dots and A, B, C, \dots the poles of a, b, c, \dots A curve may be the locus of a point on the envelope of a line, and the reciprocal curve will be the envelope of the polar or the locus of the pole. It is proved that a conic reciprocates into a conic, and with a circle as base conic, a conic may, in particular cases, be reciprocated into a circle. So many propositions give rise to corresponding propositions by reciprocation. Projective methods may be used in much the same

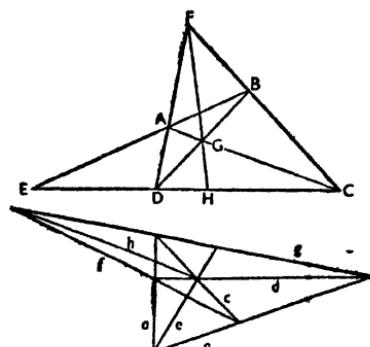


FIG. 6. VERTICES

way for solid G ., but, in general, solid G . is best treated by analytical methods. See B. Russell, *Foundations of Geometry* (1897), and C. V. Durell, *New Geometry for Schools*, 1939. It was mentioned above that projective G . was in some respects non-Euclidean. The general term non-Euclidean is given to those geometries

which are not based on Euclid's assumptions, and those which deal with non-Euclidean space. Among later geometers much discussion arose over the validity of some of these assumptions, notably that dealing with parallel lines, and other alternative assumptions were made. Thus Lobatchewski substituted for it: that all lines drawn from a point may be divided into two classes, with reference to another

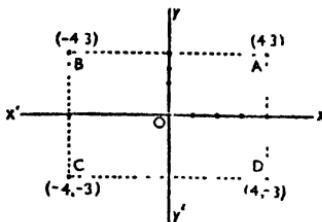


FIG. 7. CO-ORDINATES

line—intersecting and non-intersecting—and that the two classes are divided by a parallel line. The two dividing lines cut the given line on two separate points at infinity, and both made acute angle with the perpendicular to the line, and thus he developed a series of propositions. Again, it is questionable whether the statement that a straight line is the shortest distance between two points is essentially true; there may be space beyond our conception in which it is not so; and in which, too, the angles of a triangle formed by the shortest distances joining three points are not equal to two right angles. Such space would be an example of non-Euclidean space. Riemann's system of non-Euclidean geometry commands a great deal of importance to-day in modern theories of the universe and in the theory of relativity. It contains two fundamental conceptions, viz., (i.) that of a manifold, (ii.) that of the measure of the curvature of a continuous manifold possessed of what he calls flatness in the smallest parts (see A. N. Whitehead, *Universal Algebra*).

ANALYTICAL GEOMETRY differs from pure G. in that problems are solved by algebraical methods. It necessarily enables solutions to be found in certain cases where the methods of pure G. are much less convenient. This branch of the subject is also known under the heading *coordinate geometry*, since the position of a point is determined by its co-ordinates or distances from certain fixed axes. In its most elementary form it is familiar to most under the name *graphs*. The student first learns to plot the position of a point with reference to two fixed perpendicular axes, (in plane G.). By measuring a distance 4 units along Ox and then 3 units parallel to Oy , the point A is obtained (Fig. 7). It is said to be the point $(4, 3)$ or the point $x=4, y=3$. The first of the two co-ordinates is known as the *abscissa*, and the second as the *ordinate*. If the first number is negative it is measured in

direction Ox^1 . If the y -co-ordinate is negative, it is measured along Oy^1 . Hence B, C, and D are respectively the points $(-4, 3)$, $(-4, -3)$, $(4, -3)$. Now consider the equation $3x+4y=12$. It is possible to find any number of sets of values for x and y to satisfy the equation. Take each pair of values in turn and plot out the corresponding point on the graph, and it will be found that all these points lie on a straight line. $3x+4y=12$ is then said to be the *equation of the straight line*. In a similar way it is found that every equation of the first degree in x and y represents a straight line. It obviously follows that a set of values for x and y which satisfy two such equations at once must represent the point of intersection of the two lines. Hence the algebraical solution of two equations gives the co-ordinates of the point of intersection of the lines they represent. By similar methods the loci corresponding to equations of the second degree in x and y may be traced, and the algebraical solution of any pair of equations gives sets of values for $x+y$ which represent the points of intersection of the loci. Such is the practical beginning of co-ordinate G. It may easily be established that a straight line must be represented by some equation of the first degree, that the straight line $Ax+By+C=0$ cuts the axes in points $\left(-\frac{C}{A}, 0\right)$ and $\left(0, -\frac{C}{B}\right)$, that it makes an angle $\tan^{-1}\left(-\frac{A}{B}\right)$ with the axis of x , and so on. Various formulae are developed for the distance between two points, the distance from a point to a line, the angle between two straight lines, and so on. A corresponding list of formulae may also be found for *oblique axes*, that is, where the original axes are taken inclined at an angle α instead of a right angle, and the co-ordinates are measured parallel to the axes.

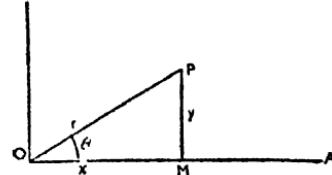


FIG. 8. CARTESIAN METHOD

The method of representing a point by its distances measured parallel to axes is known as the *Cartesian method*. Any point may also be represented by the distance OP and the angle POM , known as the *polar co-ordinates*. The connection between the two systems may easily be seen from Fig. 8 to be $x=r \cos \theta$ and $y=r \sin \theta$, and hence the polar equation of any locus may be deduced from the Cartesian equation, and vice versa.

In Cartesians a circle of centre (h, k) and radius a has an equation $(x-h)^2 + (y-k)^2 = a^2$, and where the point O_1 (the

(origin) is the centre, this becomes $x^2 + y^2 - a^2$. From the locus definition of a circle its equation is found to be of the form $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ (where $a = b$ and $h = 0$; $a, b, c, \text{etc.}$, are constants), i.e. of the second degree; when the axes are suitably chosen, an ellipse, parabola, and hyperbola may respectively be represented by $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$, $y^2 = 4ax$, and $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$.

From these equations series of formulae may be formed for tangents and normals at any point, the polar of a given point, and so on, and thus the G. of conic may be treated from an algebraical point of view. Equations of the third and fourth degree in x and y , which result in more complicated curves, may be treated in a similar way.

Mention must also be made of *homogeneous co-ordinates*, by which a point is represented by three co-ordinates with respect to a triangle, known as the triangle of reference. The method has the advantage of giving equations in symmetrical form. In *trilaterals*, the co-ordinates a, b, c are the distances from the sides of the triangle, and are connected by the relation $aa + bb + cc = 2A$. In *arcs* the co-ordinates x, y, z are the ratios of the perpendicular distances to the altitudes of the triangle, and are connected by the relation $x + y + z = 1$. Here also a straight line and a conic are represented by equations of the first and second degrees respectively. In *tangentials* a line is represented by three co-ordinates and a point by an equation. Solid G. is in many respects analogous with plane G. A third axis Oz is taken perpendicular to the plane containing Ox and Oy , and a point thus has three Cartesian co-ordinates x, y , and z . The equation $Ax + By + Cz + D = 0$ of the first degree now represents a plane. A straight line is the intersection of two planes, and hence is represented by two equations of the first degree. The three polar co-ordinates (r, θ, ϕ) are connected with x, y , and z by the equations $x = r \cos \theta \cos \phi$, $y = r \cos \theta \sin \phi$, and $z = r \sin \theta$ (Fig. 9). In Cartesians, the equation of a sphere of centre (h, k, l) and radius a is $(x - h)^2 + (y - k)^2 + (z - l)^2 = a^2$, and when O is the centre, the equation is $x^2 + y^2 + z^2 = a^2$. The general equation of the second degree is a solid of which all plane sections are conics and is called a *conoid*. A particular case is the ellipsoid, whose equation is $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$.

From these equations formulae for tangent planes, normals, etc., are developed very much as in plane G. Many solid G. methods are, in fact, analogous with those of plane G., and many of the simpler surfaces may be derived from conics. Thus, surfaces of revolution are obtained by revolving some plane curve about an axis in the same plane. The *hyperboloid of two sheets* and an *elliptic paraboloid*, for example, may be generated by the motion of a variable ellipse and a parabola respectively, and finally the *hyperboloid of one sheet*, the *hyperbolic paraboloid*, the cone and the cylinder, and others known as *ruled surfaces* may be generated by the

motion of a straight curve. A curve in space may be represented by two equations, and hence the properties of such a curve are obtained by expressing the three co-ordinates as functions of a single variable. Such a curve is treated as a polygon, whose sides are indefinitely small. The plane of any two consecutive sides does not in general contain the next consecutive side. These are called *tortuous curves*. By supposing x, y, z, w to be the four co-ordinates of a point in four dimensions, a similar series of results may be

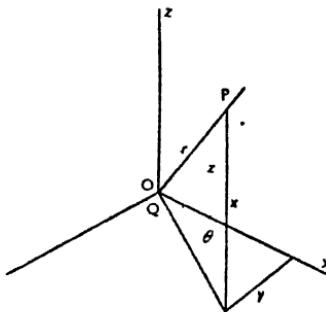


FIG. 9. SOLID GEOMETRY

obtained. See E. H. Askwith, *Course of Pure Geometry*, 1921; E. L. Tweedy, *Junior Geometry*, 1928; and J. Todhunter (ed.), *The Elements of Euclid*, 1862 (Everyman's Library, 1933). For plane analytical G. the student may be referred to H. J. Smith, *Co-ordinate Geometry* (for elementary work), and A. Clement-Jones, *Introduction to Algebraical Geometry*; for solid G. to P. Frost, *Solid Geometry*, 1875; G. Salmon, *Analytic Geometry of Three Dimensions*, 1862; A. R. Forsyth, *Geometry of Four Dimensions*, 1930; D. M. Y. Sommerville, *Analytical Geometry of Three Dimensions*, 1934; and A. Robson, *An Introduction to Analytical Geometry*, 1910.

See also DIMENSION, GEONOMY, GEOPHYSICS, see under GEOGRAPHY.

Geopolitics, modern version of political geography, or anthropogeography. As such, though not novel, it has accumulated a respectable amount of scientific material. In its political aspect it serves as a weapon of modern National Socialism, a rationalising ideology of imperialist expansion. It is this aspect of G. which has naturally aroused wide interest, and no little misunderstanding. Regarded as a world outlook, G. is a comprehensive *Weltanschauung*, which has fired the imagination and gained the loyalty of a small yet significant group of enthusiastic adherents. This latter is the least discussed side of G., but is probably the most crucial, for it explains the appeal of this pseudoscience to immature and susceptible minds and also indicates clearly its power and danger. The difficulty of analysing G. arises largely from the fact that the above

noted aspects are inextricably intermingled in the minds of its advocates and enemies alike. Used by the Ger. publicists to justify the moral basis of *Lebensraum* (q.v.), *Geopolitik*, in the hands of Prof.-General K. Haushofer, became a new fashion, which soon raised its chief exponent to the role of 'the man behind Hitler.' But Haushofer's definition of G. as 'a study of the dependence of political events on the character of the earth' was not his invention, though it seems to imply some novelty; and but little that was added to it by his Institut für Geopolitik will survive criticism. The significance of political geography was recognised as long ago as the time of Herodotus and Thucydides. Bodin and Montesquieu, Ranke and Ritter all showed conclusively the importance of climate and environment in the hist. of mankind. Dietrich von Bülow's *Spirit of the New System of War* (1799) is a study in geopolitical vein. That the geographical approach to hist. and politics was well estab. long before the emergence of *Geopolitik* may be seen from the pages of H. T. Buckle, Taine, and particularly Treitschke, the historian of the Bismarckian age, and Otto Hintze, master of Prussian hist., whose discussion of the antithesis between the political destiny of the democratic &c., Britain, and that of Prussia, the militant continental state encircled by competing land powers, has long been an accepted textbook on the Continent. The later development of the study of G. came with Friedrich Ratzel, who expounded the first great scientific theory of the environmental basis of society, and Rudolf Kjellén, who popularised Ratzel's writings. All this material provided a working basis for the wider investigation of G. in the period following the First World War; and while no doubt the Haushofer school was greatly indebted to this pre-existing material, even on an elementary plane, it contributed to the revitalisation of the collated factual data, and, of course, in Germany it awakened a wider interest in climate, natural resources, configuration, and topography considered primarily in terms of strategy. After the days of Ratzel's *Seven Laws of Expansionism* G. built up an imposing catalogue of rules and concepts. Many of them are but platitudes or half truths, though obscured in a flashy journalistic terminology, which makes works on G. difficult reading for the uninitiated; but in these voluminous utterances are sometimes implied genuine realities, which should not be lightly dismissed merely because they have been applied unscrupulously for political ends. Exponents of *Geopolitik* seized, after Verwelles, on the idea of 'space-conquering forces' (borrowed from Ratzel), and claimed that *Geopolitik* was the liberator from prov. nationalism and the expression of a still inarticulate longing for a new world order. It may be noted here that the Ger. geopolitical school was officially launched in 1924, the year in which Germany overcame inflation, and its inauguration heralded the dawn of a new imperialism, accompanied by the resus-

citation of such aspirations as the *Drang nach Osten*. From Kjellén's *Realpolitik*, too, Haushofer's school learned that if G. was to become a lodestar of a synthetic science the idea of a state must be widened far beyond the merely legal concept. Sir Halford Mackinder's doctrine of land power—a corrective of Mahan's thesis—as expounded in his *Geographical Pivot of History* (1904)—conceived world politics as essentially a conflict between oceanic and continental powers. His *Democratic Ideals* (1919) was an unheeded yet salutary warning against the emergence of a land bloc that would prove invulnerable to sea power. It was reiterated at the time of the Versailles peace conference, but the system as dictated by the great sea powers in the Versailles Treaty neglected the potentialities of such great compact land masses. Haushofer's doctrine has been well described as 'Mackinder in a strait jacket.' It was on its use as a political weapon that the *Geopolitik* of Haushofer's school of fanatical disciples won historical significance. See S. Neumann, 'Fashions in Space,' in *Foreign Affairs*, vol. xxi, No. 2; R. Henning, *Geopolitik, die Lehre vom Staat als Lebewesen*, 1928; O. Maull, *Das Wesen der Geopolitik*, 1936; S. von Vulkenburg, *Elements of Political Geography*, 1939; and Field, *Geopolitics*, 1944.

Geoponici, name given to various Gk. and Rom. writers on agriculture, also known as *Scriptores rei rusticæ*. The Alexandrian writers were great compilers of treatises on agriculture, *Ptolemaika*, and they were used by later writers, such as Cassianus Bassus, who wrote at the end of the sixth century A.D. A great source from which such compilations were made was that of Mago of Carthage, frequently condensed and trans. Cato the Elder wrote a practical treatise, *De Agricultura*, of which parts survive, but the chief authorities, still full of useful advice and of inestimable value for knowledge of past systems of farming, are the *Liberi Tres Rerum Rusticarum* of M. Terentius Varro, and the *De Re Rustica* of L. J. M. Columella, from which Palladius compiled his work in the fourth century A.D.

George, Saint (d. 303), the patron saint of England, was b. according to hagiologists, in Cappadocia of a noble Christian family, became a soldier, served the Emperor Diocletian with distinction, rebuked the emperor for his persecution of Christianity, and suffered a martyr's death at Nicomedia. Eusebius (*Historia Ecclesiastica*, viii. 5) writes of a nameless martyr under Diocletian in Nicomedia, and a still earlier record speaks of the martyrdom of the Holy George in 225. The existence of the saint has been doubted, and Gibbon identified him with George of Laodicea, an Arian bishop of Alexandria, which in view of Eusebius's testimony is chronologically impossible. His authenticity was doubted in the early Church, but the shrine of the martyr at Lydda was a place of pilgrimage to crusaders, and his fame was recognised by the Moslems. Near Lydda was the traditional site of the rescue of Andromeda from the sea-monster by Perseus, and

naturally the Christian martyr absorbed the pagan legend to himself, with the story of St. G. and the Dragon, known from the sixth century and rendered famous by the *Golden Legend*. St. G., who was the patron saint of Genoa, was not adopted formally by England till the reign of Edward III. April 23 is the date assigned to his feast.

George I. (George Louis) (1660–1727), king of Great Britain and Ireland. Inherited from his father possessions which in 1692 had been made into an electorate. He married his cousin Sophia Dorothea of Zell (or Celle), who in 1694 was divorced by him because of her alleged misconduct with Count Königsmark. The morale of Ger. courts at this mark took their tone from the profligacy of Versailles; but in Hanover conjugal infidelity was held to be a privilege of the male sex. Count Königsmark was assassinated and Sophia remained in seclusion till her death in 1726. The mother of G. was Sophia, the grand-daughter of James I., and although the possibility of succession to the Eng. throne seemed remote, the question of Protestant succession gave the succession to the Hanoverian line by the Act of Settlement, 1702. During the war of the Sp. Succession G. sent forces to the allies at Blenheim and made a strong alliance with Marlborough. Realising the importance of the Crown of England, he persisted in keeping on very friendly terms with the Whigs. In 1714 the death of his mother (Sophia) and of Queen Anne laid the way open for his succession to the Eng. Crown. The intrigues of Bolingbroke were unsuccessful, owing to the sudden death of the queen. G. was proclaimed. He came immediately to England. His succession may be regarded as the final step in the Protestant revolution, and the stability of his crown may be gauged from the utter failure of the Jacobite rebellion of 1715. His accession was important from many points of view. In the first place, he understood no Eng., his ministers did not understand Ger., hence his presence at Cabinet meetings was futile. Accordingly he stayed away, and the power passed into the hands of a Prime Minister (Walpole). Secondly, he insisted upon choosing his ministers from the ranks of the Whig party. He did not realise the importance (as had William III.) of being entirely independent of party politics; thus he prepared the way for the rule of the Whig oligarchy, which was only overthrown by his great-grandson George III. Thirdly, he regarded England merely as a great country of which he was the nominal ruler, and which was to raise the prestige of Hanover and fill his pockets and the pockets of his Ger. followers with Eng. gold. He was not, however, by any means devoid of power. The great event of his reign was the bursting of the South Sea Bubble, which gave Eng. commerce a great shock, but produced also the greatest of our peace ministers, Walpole. George d. one year after his unhappy wife, whilst travelling to Hanover. See W. R. H. Lecky, *A History of England in the Eighteenth Century*, 1892; L. Molyneux, *The First George in Hanover and England*, 1908;

J. F. Chance, *George I. and the Northern War: a Study of British-Hanoverian Policy, 1709–21*, 1909; J. McCarthy, *A History of the Four Georges*, 1905; and Sir H. M. I. Terry, *A Constitutional King—George the First*, 1927.

George II. (George Augustus) (1683–1760), king of Great Britain and Ireland, only son of George I. In 1705 he married Wilhelmina Caroline of Anspach. In 1707 he was created earl of Cambridge, and in 1708 he was present at Oudenarde. During his father's reign he was on bad terms with the sovereign during the greater part of the time. Bad feeling between father and son seems to have been one of the Hanoverian hereditary qualities. During the greater part of the reign of George I. he was regarded as the official centre of the opposition, and Walpole expected dismissal when George I. d. In accordance with his sentiments as Prince of Wales, G.'s first act was to dismiss Walpole, and invite Sir Spencer Compton, Speaker of the House of Commons, to take his place. Sir Spencer, however, was so incompetent that he actually asked Walpole to help him in writing the king's speech. The queen, Caroline, who was Walpole's friend, at once pointed out the absurdity of this. G. was convinced by her arguments, and when Walpole himself promised to propose a large addition to the king's ann. income, or civil list, the old minister was reinstated, and received the loyal support of the king until his resignation. G. was a man with the character and habits of a drill sergeant. He was a man of method, very economical, and with a prodigious memory. He was stubborn and very obstinate at times, but when he realised that the influence which was brought to bear upon him was that of a greater and wiser mind than his own, he submitted to it quite easily, and it is to his credit that he was, in spite of his qualities to the contrary, capable of recognising this. The politics of the greater part of his reign were quiet. Walpole, with his policy of 'Let sleeping dogs lie,' and his ability of reducing corruption to a fine art, gave the country a much-needed peace, but, at the same time, by his methods and by his inability to work with capable men, raised up an opposition. In 1737 Caroline d., and, with her influence removed, matters became much more difficult for Walpole. The war of the Austrian Succession led to his resignation in 1742, and the policy of the war itself was directed by the king and cabinet purely from the Hanoverian point of view, without any consultation of the people of England. G., like his father, recognised Hanover as the dearer of his two possessions. That G. did not lack military skill or courage is obvious from his presence and victory at Dettingen (1743). The importance of the reign lies to a very great extent in the facts that G. realised that he must play the part of a constitutional monarch, and that it was not possible to change his ministers and policies at will. Secondly, the rebellion of 1745 proved that personal loyalty to the Hanoverian succession was not yet a factor in practical

politics, and that the Protestant Ger. succession was to a very great extent regarded as a business transaction. The traditional bad feeling between the king and the heir apparent was maintained by the conduct of G. and Frederick, Prince of Wales (d. 1751). G. himself d. in the middle of the Seven Years war. See H. Walpole, *Memoirs of the Reign of King George II.* (ed. Lord Holland), 1846; Lord Horvey, *Memoirs of the Reign of George II., from his accession to the death of Queen Caroline*, 3 vols., 1884; and R. J. Lucas, *George II. and his Ministers*, 1910.

George III. (George Frederick William) (1738-1820), son of Frederick, Prince of Wales, and grandson of George II., whom he succeeded in 1760. He was b. on June 4, 1738. After the death of his father he was educated chiefly under the care of the dowager Princess of Wales (his mother) and the earl of Bute (q.v.). The lines of his education decided his policy as a king, and he was educated chiefly, at least in policy, on the lines of the *Patriot King*, a book written by Bolingbroke. During the period which had followed the accession of George I., the political power of the country had passed into the hands of the Whigs. The Whig oligarchy had been everywhere supreme, and it was by the great Whig families that the policy of England was dictated. This had to a large extent been the result of the policy adopted by George I. G. was imbued with the idea that the great work of his life must be the overthrow of this power and the re-establishment of the power of the Crown. During the reign of George II. the power of the Crown had been relegated to a very distant position, but at the same time the power of the Whig oligarchy had also received some very shrewd blows. The power of Wm. Pitt had been a very hard morsel for the Whig magnates to swallow; that they had been forced to accept the Pitt-Newcastle administration showed that their power was wanling. G.'s mind had, as Prince of Wales, been set against the system by which the king chose his ministers from that party which was most powerful in Parliament. He wished to break up party, to choose his own ministers, and to formulate his own policy—in effect, to be his own Prime Minister. The earliest phase of the struggle resolved itself into a contest between the great Whig families, between whom had sprung up a strong sense of rivalry. The king looked on from behind, and, whilst striving to attain his desire, at the same time held back until such time as he could associate himself and his party with some phase of national life upon which party feeling was strong. He endeavoured to regulate affairs by means of the party known as the King's Friends, and also his earlier attempts to choose his own ministers and ministry must not be overlooked. His first choice, the earl of Bute, was unfortunate, but Bute retired early in 1763, and did not again return to office. The Amer. question, leading to the War of Independence, gave the king an opportunity which was not to be overlooked. The king was

probably honest in his inability to see anything unconstitutional in the attitude which he adopted towards the Amer. colonists. In this he was very largely at one with the nation; the nation as a whole was just as mistaken as G. Why the Amer. should not contribute to the cost of a war which had been fought in their defence, and why it was unconstitutional for Parliament to levy taxes on the Amer. colonies, were two points which the king and the nation could not understand. The king chose his own minister (Lord North) and plunged into the war, believing that it was a justifiable one, and certainly never entertaining any doubt but that the result would be victory. The disasters of the war found him unmoved; the coalition of France, Spain, and America failed to open his eyes to the danger. As he himself said at a later period, he fought the Amer. colonies because he believed that the Amer. colonies were in the wrong, and he fought right to the end: he was the last to give in to the opening of the negotiations for peace.

During the Amer. struggle the constitutional struggle had gone on at home. The king had insisted upon the retention of office by Lord North; only when the surrender of Yorktown drove even Lord North to resign did he send for the Whig, Lord Rockingham. The peace of Verailles (1783) gave America her independence, but gave England better terms than had at one time seemed possible, since the victories of Rodney and the Fr. and Sp. failures had strengthened her hand. The whole struggle, however, is illustrative of the fact that England was plunged into a world war, in which she lost a great deal of her prestige, simply because of the obstinacy of a king working on apparently constitutional lines through his Parliament. Rockingham d. in 1783, and was succeeded by Lord Shelburne, whose short-lived ministry was overthrown by a coalition of Fox and North. The coalition ministry took office only in turn to be dismissed when their India Bill was rejected by the Lords. The king sent for Wm. Pitt, and the famous son of a famous father became the Prime Minister. On the surface, at any rate, the king had triumphed; he had overthrown the coalition, and he had appointed his own minister: the influence of the Crown was apparently restored. The means employed by the king to bring about this end were, however, questionable; the coalition had been overthrown in the House of Lords solely by means of the influence of the Crown. The king had intimated through Lord Temple that any peer voting for the India Bill would be regarded as a personal enemy of the king. Pitt, without a majority of the House of Commons to support him, had been appointed minister, and was supported by the influence of the Crown until finally, two months later, a dissolution and general election returned a majority in favour of the king and his minister. The dissolution was the work of the Crown entirely, but the country supported the king and Pitt, and from the moment that a majority

of the House of Commons gave their adherence to Pitt it may be said that his period of office became really constitutional. Of the king's personal popularity in the country there can be no possible question. In 1788 he became ill and his mind gave way. During this period of insanity the regency question was debated in the House of Commons, and Pitt was probably only saved from dismissal by the recovery of the king. The thanksgiving service which the king attended in 1789 was one great ovation for the king himself, and the outbreak of the revolution in France did much to increase his popularity. He was regarded as the centre of all opposition to the Fr. and to the ideals which the revolutionists put forward. Probably his quiet home life and the purity of his family life had much to do with his popularity, but above everything it must be remembered that when G. was obstinate he usually had the nation behind him. The next great question which arose was the question of Catholic emancipation. The Act of Union had been accompanied by a promise of relief to the Catholics. Pitt's proposals were brought to the ears of the king, and he rejected them entirely. He averred that his honour and his coronation oath were at stake. Pitt, rather than force his proposals on the king, resigned, but the attitude of the king was approved and supported by the vast majority of the nation. Addington, a man of mediocre abilities, succeeded Pitt, and retained office until the outbreak of war, when Pitt again came into office. The king's mind was again for a season unhinged, and the attacks now became more and more recurrent. The ministry of Pitt had included no one of outstanding ability save Pitt himself; he had proposed the inclusion of Fox, but the king declined him for personal reasons. The death of Pitt, however, changed the situation, and the king accepted Fox in the ministry of 'All the Talents.' A mild form of Catholic emancipation was proposed but rejected by the king, who demanded a promise that the question should not again be raised during the reign. The promise was not given, and the ministry was turned out of office. The duke of Portland succeeded as Prime Minister, and was himself replaced later by Pelham, the real leader of the ministry. The reign may definitely be taken as closing in 1811, when the king's reason finally failed him. He lived on for nine years blind and insane. To his people G. was always a most popular king. He had said at the beginning of his reign that he gloried in the name of Briton, and it is because his good and bad qualities were so essentially Eng. that he achieved the success that he did. He was above all things like a typical Englishman of the time, a man with all the prejudices and virtues of the Eng. nation of the eighteenth century. He married in 1761 Charlotte Sophia of Mecklenburg-Strelitz, and had nine sons and six daughters. The death of his youngest daughter, the Princess Amelia, in 1810, brought on the final attack of insanity, from which he never recovered.

His eldest son, George, was appointed regent until his father's death in 1820. See W. Donne (ed.), *Correspondence of George III. with Lord North*, 1867; J. H. Jesse, *Memoirs of the Life and Reign of George III.*, 1867; L. Melville, *Farmer George*, 1907; B. Willson, *George III. as Man, Monarch, and Statesman*, 1907; Sir G. O. Trevelyan, *George III. and Charles Fox*, 1912; Sir C. G. Robertsoff, *'Hatham and the British Empire*, 1946; and H. Butterfield, *George III., Lord North, and the People*, 1779-80, 1948.

George IV. (George Augustus Frederick) (1762-1830), king of Great Britain and Ireland, was the eldest son of George III., and was b. at St. James's Palace on Aug. 12. He grew up to be exceedingly well-gifted and of exceptionally handsome appearance. The strictness and the seclusion of his home life helped to drive him to a life of extravagance and profligacy, and he plunged heavily into the gay life of London society. His first mistress was the actress, Mary Robinson. Gradually he became more and more estranged from the king, the wildness of his life and his political associates, Fox and Sheridan, both Whigs, helping to widen the breach. In 1783, having come of age, he was given a separate estab. at Carlton House, his debts were paid, and he was granted £50,000 per annum from the Civil List. Shortly after his coming of age he became madly in love with a beautiful widow, Maria Fitzherbert, who came of a good Shropshire family, and who had been married twice before she met the prince. She was a Catholic, and marriage with her was impossible under the Act of Settlement of 1689, and further, the Royal Marriage Act of 1772 forbade any marriage without the knowledge of the king. She refused to contemplate becoming the mistress of G., and finally, in 1785, they were married by a clergyman of the Eng. Church. This marriage was acknowledged secretly by his friends and denied openly for political reasons. Their relations were broken off in 1794, and again renewed in 1800, and she remained his wife in name until 1811. By the relations of the prince she was always regarded as his wife, although not acknowledged so. In 1795 the prince, having broken off relations with Mrs. Fitzherbert, was married to a Ger. Protestant princess, Princess Caroline of Brunswick. His treatment of his wife was unjustifiable and cruel, and after the birth of the Princess Charlotte, their only child, they were separated. The position of the prince was peculiarly important in view of his father's disease. He and his friends claimed that he had the right of becoming regent without the consent of Parliament, but the Regency Bill only provided for his appointment with certain restrictions. In 1811 he became Prince Regent, and continued in that office until the end of the reign. His treatment of his wife, his extravagance, and his loose living, especially at a time of almost universal distress, made him exceedingly unpopular in the country. His appearance in the streets of London was a sign for the outburst of hissing, and in

1817 he was stoned on his way to open Parliament. In 1820 he succeeded his father, and immediately there arose the great trouble with his discarded wife. Her name left out of the Prayer Book, her title withheld, and her honour doubted, she came to England to enforce her claims. Already the king had tried to divorce her, now she was accused of adultery, and a Bill of Pains and Penalties was passed hurriedly by over-decreasing majorities. Her cause was warmly espoused by the nation, who held that even were the charges true, the life of the king was not such as to justify him in making any charges. The disowned queen tried to force her way into the abbey during the coronation proceedings, failed, and retired to die in the Aug. of 1821. The king visited Ireland and Scotland during the early days of his reign, and his popularity there was much greater than it was in England. He attempted in a feeble way to continue the policy of royal influence, but was forced to give in. He hated Canning, but was compelled by circumstances to accept him as a minister, and later as Prime Minister. He also later strove to oppose Catholic emancipation, but again he was compelled to give in, and the Bill passed in 1829. In the following year G. d. Though he reigned for ten years, he exercised no great influence on public affairs, and, as a ruler, he was neither successful nor popular. His only child, the Princess Charlotte, d. in 1817. She had married Leopold of Saxe-Coburg in the previous year. See R. Hulsh, *Memoirs of George the Fourth*, 1830; R. Grenville, duke of Buckingham, *Memoirs of the Court of England during the Regency, 1811-20*, 1856, and *Memoirs of the Court of George II.*, 2 vols., 1859; P. H. Fitzgerald, *The Life of George the Fourth*, 1881, 1906; J. McCarthy, *History of the Four Georges*, 1881-1901; S. Walpole, *A History of England from the Conclusion of the Great War in 1815*, 1890; W. H. Wilkins, *Mrs. Fitzherbert and George IV.*, 1905; G. M. Trevelyan, *British History in the Nineteenth Century, 1782-1901*, 1922; and Dorman Crosson, *The Regent and his Daughter*, 1932.

George V. (George Frederick Ernest Albert) (1865-1936), king of Great Britain, Ireland, and the Brit. dominions beyond the seas, emperor of India; second son of King Edward VII., was b. at Marlborough House, London. In 1877 he and his brother the duke of Clarence became naval cadets. Two years later they cruised to the W. Indies in H.M.S. *Barchante*, and in the following year they made a more prolonged cruise in the same ship. Prince George was intended to remain in the naval service; for that reason he was appointed to H.M.S. *Canada* in the N. Amer. and W. Indian station, and became a sub-lieutenant. In 1885, after a course at the Royal Naval College at Greenwich, he became a lieutenant; and in 1889 he commanded a torpedo boat in the naval manoeuvres. In 1890 he commanded the gunboat H.M.S. *Thrush*; and in 1892 he relinquished his commission in the navy on becoming heir apparent through the

death of the duke of Clarence. In 1892 he was created duke of York; on July 6, 1893, he married the Princess Victoria Mary of Teck. The duke and duchess visited the Commonwealth of Australia in 1901. They visited during the return journey S. Africa and Canada. In Nov. 1901 the duke was created Prince of Wales. He succeeded his father May 6, 1910, as George V. He was crowned June 22, 1911; and at the end of that year he visited India, being the first Brit. emperor to do so. At his Durbar at Delhi, the transference of the Indian cap. to that place was announced. In July 1914 he called a conference at Buckingham Palace of all



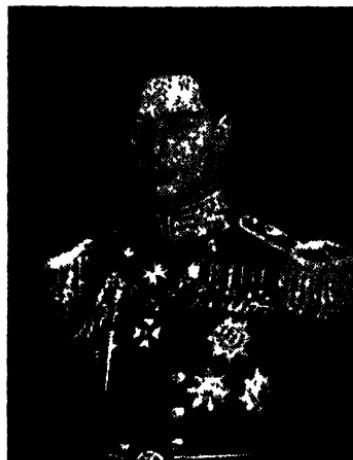
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Brit. and Irish parties to attempt settlement of the Ulster difficulty. During the First World War he frequently visited the W. Front. On July 17, 1917, he proclaimed an alteration in the style of the royal house; in future to be known as 'of Windsor'—all Ger. titles having been renounced. Immediately after the Armistice he made sev. triumphal progresses through London; and he attended service in St. Paul's. In Nov. and Dec. he visited Paris and the battlefields; in Dec. he entertained President Wilson in Buckingham Palace. On June 22, 1921, at Belfast, he inaugurated the Parliament of N. Ireland. He visited Belgium again in May 1922; in May 1923 he visited Rome, and was received by the pope. In April 1924 he opened the Brit. Empire Exhibition at Wembley; on July 19 of same year he was present at the consecration of Liverpool cathedral. In the spring of 1925 he was absent from the kingdom sev. weeks, on a health-cruise in the Mediterranean. At the end of Nov. 1928 he fell

ill of pleurisy, underwent an operation, and was in so serious a condition that councillors of state were nominated, and all members of the royal family summoned to Buckingham Palace; but he made recovery, and in Feb. 1929 was able to go to Bognor to recuperate. He did not resume opening Parliament in person until Oct. 28, 1930. In the period of social and economic turmoil which followed the First World War the popularity of the throne and personal affection for the king and queen steadily increased, as was shown by the anxiety manifested during the king's illness in 1928, the unprecedented enthusiasm which marked his silver jubilee in May 1935, and the universal grief which followed his death on Jan. 20, 1936, at Sandringham. Some of the most important events of his reign, apart from the First World War, were the extension of the franchise to women, the estab. of the Irish Free State (1922), the formation of the first Labour Gov. (1924), the General Strike (1926), the economic crisis (1931), and the introduction of the new Indian constitution. King George VI. on Oct. 22, 1947, unveiled the statue of his father, which is part of the national memorial. The statue stands in the grounds of Westminster Abbey, exactly opposite the entrance to the House of Lords, and is the work of Sir Wm. Reid Dick. See also KING GEORGE'S FIELDS FOUNDATION. He had five sons (one, John, dead) and one daughter; the eldest son, Edward, was created Prince of Wales, 1910. See J. Buchan, *The King's Grace*, 1935; J. Gore, *King George V.: A Personal Memoir*, 1941; also life by A. Bryant, 1936.

George VI. (Albert Frederick Arthur George of Windsor), king of Great Britain, Ireland, and the Brit. dominions beyond the seas (the title 'Emperor of India' was dropped from the royal style in 1917 on the passing of the Indian Independence Act of that year); b. Dec. 14, 1895, at York Cottage, Sandringham; second son of George V. Educated Royal Naval College, Osborne and Dartmouth; Trinity College, Cambridge. Present at battle of Jutland, 1916. On staff of commander-in-chief, Portsmouth, 1916-17. Lieutenant, R.N., 1918. Made Baron Killarney, earl of Inverness, and duke of York, June 3, 1920. Married Elizabeth, daughter of the earl of Strathmore, on April 26, 1923, at Westminster Abbey. A counsellor of state during the illness of his father, 1923-29. On the abdication of his brother, King Edward VIII., he succeeded to the throne on Dec. 10, 1936. His coronation took place at Westminster Abbey on May 12, 1937. Through their strongly democratic appeal the king and queen soon won great popularity, besides restoring the prestige of the Crown. King George himself is distinguished by a kind and unceremonial manner, and a high sense of duty. With the queen he made a seven-week tour of Canada, the U.S.A., and Newfoundland in May and June 1939, meeting with a memorable popular reception. He was the first reigning Brit. sovereign to visit America. For the first time in hist. he performed

royal functions in a dominion, appearing in the Canadian Parliament, giving the royal assent to Bills, receiving the U.S. minister to Canada for the delivery of his credentials and signing the Canadian-Amer. treaty of commerce. This was a landmark in the constitutional hist. of the Brit. Empire and Commonwealth of Nations; yet it was the corollary to the Statute of Westminster (q.v.), and indeed followed naturally from the relations between Britain and the self-governing dominions as they had evolved for many years before the statute. Commonwealth relations to-day have emphasised that in matters pertaining to the dominions the king is advised by the ministers of the



Flight and Try

H.M. KING GEORGE VI.

dominion concerned, and not by United Kingdom ministers. After visiting Canada King George visited President Roosevelt at Washington, was welcomed by the U.S. Congress at the Capitol, and inspected the New York World's Fair. During the visit he laid a wreath at the tomb of George Washington at Arlington.

Early in the Second World War he visited the Brit. Army in France (Dec. 4-10, 1939). On the resignation of Mr. Neville Chamberlain he sent for Mr. Winston Churchill (May 10, 1940), who formed a Coalition Gov. Throughout the war he shared the common suffering of his people, and thereby promoted a spirit of harmony. Always interested in industry, he paid numerous visits to factories, shipyards, and docks. During the air raids Buckingham Palace was three hit. A delayed-action bomb dropped on Sept. 11, 1940, and the windows of the apartments of the king and queen were blown out, while on a later occasion the royal chapel was wrecked. Made many visits to severely bombed areas in London, and to all the great prov. cities which had been attacked.

He visited Malta (June 20, 1943) to convey his appreciation of the fortitude of the Maltese during their long ordeal. The George Cross instituted by the king (Sept. 1940) for deeds of conspicuous civilian gallantry had previously been conferred upon the people of the is. by the king (April 1942). After Germany's surrender he received Gen. Eisenhower at Buckingham Palace, and conferred on him the O.M. (June 12, 1945). Later he met President Truman in the *Renown* in Plymouth Sound (Aug. 2). After the war he entertained the delegates to the General Assembly of the United Nations at St. James's Palace, when he pledged the full co-operation of the Brit. people (Jan. 9, 1946). He took the salute of the Victory Parade in the Mall (June 5, 1946). With the queen and the two princesses he sailed in H.M.S. *Vanguard* on the first visit of a reigning monarch to S. Africa, arriving Feb. 17, 1947. Loyal addresses were presented by both Houses of the S. African Parliament, although at the time both Houses stood prorogued. He stayed five days at Durban, where no fewer than 65,000 Indians gathered at Currie's Fountains to greet the royal family. The most striking political result of the visit was the complete split b. the Indian community, owing to the ill-advised attempt of the Congress extremists to boycott the visit, an attempt which was hotly opposed by the majority of the Indian community, and in general the mass of the Indian pop. refused to carry out the boycott. He arrived in Pretoria Mar. 29, where the administrator, Gen. Pienaar, pre-cured the prin. dignitaries of the Transvaal and the city to the king and queen. At a state banquet Gen. Smuts said that time and mutual understanding had healed the wounds of the past, and enabled the two great stocks to come together, and go forward together to their greater united destiny. In reply the king referred to the evidences he had found everywhere of the sympathy felt by S. Africans for the Brit. people for the burdens they were bearing (an allusion to the economic crisis in Britain). On Palm Sunday the king and royal family made their devotions among the Dutch Reformed community in the Groot Kerk of Pretoria. On April 7 the king and royal family arrived by air at Salisbury, S. Rhodesia, on the first visit by a reigning sovereign to that country. Here he opened the S. Rhodesian Parliament, this being the first time that a royal state opening had taken place in a building that, prior to its conversion, had been a public-house. The king also visited the grave of Cecil Rhodes and the Victoria Falls. The royal tour ended on April 24 with the embarkation of the royal family on the *Vanguard* at Capetown. A further tour to Australia and New Zealand was planned for the spring of 1949, but it was cancelled owing to the illness of the king, who underwent an operation in March 1949 for the relief of an affection of the right leg.

King George and Queen Elizabeth have two daughters, Princess Elizabeth Alexandra Mary, duchess of Edinburgh (b.

April 21, 1926), heiress presumptive to the throne; and Princess Margaret Rose (b. Aug. 21, 1930). His grandson, Prince Charles Philip Arthur George of Edinburgh, was b. on Nov. 14, 1948. See R. Fulford, *George VI.*, 1948.

George V., king of Hanover (1851-66), only son of Ernest Augustus, king of Hanover and duke of Cumberland, and grandson of George III. of England, b. in Berlin, May 27, 1819. When still quite a child he lost the sight of one eye, and an accident which occurred in 1833 resulted in his being totally blind. He succeeded to the throne in Nov. 1851. Imbued from his earliest childhood with a belief in the divine right of kings, coupled with strong religious views, he was soon in conflict with his Landtag, or Parliament, his blindness making him an easy prey to unscrupulous and disloyal advisers. When Ger. affairs reached a crisis in 1866 he was unable to meet the situation. Against the advice of his Parliament he refused Prussia's demand that Hanover should maintain an unarmed neutrality while the war lasted, and immediate occupation by Prussia followed; his army was compelled to surrender, and the result was the formal annexation of Hanover by Prussia, Sept. 1866. The king made many unavailing attempts at restoration, but was never reconciled to Prussia. He retired to Gmunden in Austria, and d. while on a visit to Paris in 1878. His remains are buried in St. George's Chapel, Windsor. He married (Feb. 1843) Marie, daughter of Joseph, duke of Saxe-Altenburg, and left a son, Ernest Augustus, duke of Cumberland, and two daughters.

George I. (1845-1913), king of the Hellenes, b. at Copenhagen, the second son of King Christian IV. of Denmark, and brother of Queen Alexandra of Great Britain. On the throne falling vacant at the expulsion of King Otto in 1862, he was recognised by the powers and elected king of the Hellenes in 1863. It was shortly after this that Christian IV. became king of Denmark, and on becoming king of Greece, G. signed an act resigning his right of succession to the throne of Denmark, in favour of his younger brother, Prince Waldemar. The Gks. accorded him an enthusiastic welcome, and he ruled in strict accordance with constitutional principles, adopting as his motto, 'My strength is the love of my people.' He was one of the prin. artificers of the Balkan League, consummated in 1912, and directed against Turkey. He d. by the hand of an assassin (a Gk. named Alexander Skinas), on March 18, 1913, while walking in the streets of Salonika, a city then in the occupation of the victorious Gk. Army. He married the grand duchess Olga of Russia in 1867, and the result of this union was five sons and one daughter.

George II. (1890-1947), king of the Hellenes; b. at Tatol near Athens; eldest son of King Constantine, on whose first deposition he was excluded from succession on account of his pro-Ger. sympathies, his younger brother Alexander succeeding. Alexander dying in 1920, and the restored Constantine being again deposed, G.

succeeded Sept 28, 1902. Disputes with Italy, culminating in bombardment of Corfu, marked the earlier years of his reign. His first gov was republican in sympathy, its leading figure being Venizelist (see VENIZELOS) general. A group of royalist generals tried unsuccessfully to overthrow the gov, by force and G, being implicated, was deposed and banished, while Greece was proclaimed a republic (March 25 1924). During eleven years of exile G lived in London, but his kingship was not recognised by the Court of St James to which the Greek public had sent an ambas. In 1935 the Liberal Venizelists attempted a coup against the Conservative Populists, who were now in power. Gen. Kondylis, war minister, proclaimed himself regent, and held a plebiscite (Nov 1935) which produced the incredible result of 97.5 in favour of G's return and G returned to Athens for the second time as king. He now held scrupulously fair parl elections which ironically enough brought the republican party back in a majority, and G remained in the background for six months, when Gen. Metaxas, a leader of the Royalist party with the aid of Gen. Kondylis became dictator, abolished the constitution, dissolved Parliament, and claimed royal authority for his new regime. When Mussolini attacked Greece (April 1941) G and Metaxas declared war on the Allies side, but when the Germans invaded Greece the Greeks were defeated and G left the country for honourable exile as the head of his occupied state. When the war was drawing to a close, however, the country was riven with the bitter conflict of opposing factions. The Communist led G's (KKE) sought to seize power by violence and a bloody civil war resulted, but gradually the Royalist led G's captured the stop gap gov., and eventually on Sept 1 1946 a plebiscite once again resulted in a clear majority in favour of G's return. G, however, died suddenly on April 1 of a heart attack, only a few months after his second return to Greece, and was succeeded by his brother Prince Paul.

George Frederick Augustus (1832 1901), king of Saxony b at Dresden, the youngest son of King John of Saxony. He received a careful military training and entered the active army as a lieutenant of artillery in 1846. His name is inextricably associated with the Austro Prussian war of 1866, and during the campaign he distinguished himself by his military ability and intriguery. He succeeded his brother Albert on the throne of Saxony in 1888.

George, David Lloyd see LLOYD GEORGE, DAVID

George, Henry (1833 97), Amer economist, b in Philadelphia. He left school at an early age in order to support himself and first went to work. He afterwards learned the trade of printing, and in 1859 worked his way to California, where he became a journeyman printer. He was however, soon obliged to leave this trade, owing to its slackness, and for the next few years he drifted from one employment to another. In 1865 he began to write for

the press, and became a reporter on the San Francisco Times, where he rapidly obtained promotion. His most important work *Progress and Poverty*, was first pub in 1879, and in a few years obtained great popularity, and, by 1883, G found himself regarded as the apostle of a new social creed. He wrote numerous articles for magazines and papers on economic and political subjects, but his literary activities brought him little pecuniary return, and he remained in poor circumstances till his death. See life by his son Henry, 1900 (also included in G's collected works, 1906-11), also A N Young *History of the Single Tax Movement in the United States*, 1916, and J R Commons and others, *History of Labour in the United States*, 1918.



HENRY GEORGE

George the Scholar, see GÖTTNADUR II
George, Stefan (1868 1933), Ger poet at Bildeshaus near Berlin. In 1892 he founded his famous *Die Blätter für die Kunst* and gathered around him a band of writers who were destined to have a profound influence on Ger literature. George the poet and Friedrich Gundolf, the literary critic, were the most prominent of these. Nietzsche and Mallarmé were G's literary gods. His own poetry has much of the polish as well as the obscurity, of Mallarmé. Among his principal poetical works are (titles trans.) *Hymns* (1890), *The Lover of the Soul* (1897), *The Tapestry of Life* (1899), *Songs of Dream and Death* (1900), *Days and Deeds* (1903), and *The War* (1917). His complete works were pub in 18 vols. (1927-31). See studies by L Kluge, 1902, F Dürberg, 1908, W Schäfer, 1918, and F Gundolf, 1920, also L Walter, *Stefan George und die Blätter für die Kunst*, 1930, and A Miller, *Stefan George und Thomas Mann*, 1946.

George of Trebizond (1395-1481), Gk philosopher and scholar, b in the is of Crete, but descended from a family of Trebizond. As a scholar he was famous in connection with the revival of the study of Gk in Italy. He became prof of rhetoric

and philosophy at Venice, and gained a great reputation as a teacher and translator of Aristotle, engaging in controversy with his contemporary Gemistus Plethon, the Platonic philosopher. *Rhetorica* (1470) is among his writings. He d. in great poverty at Rome.

George, Walter Goodall (1858-1943), Brit. athlete, b. at Caine, Wiltshire. He was the winner of the record number of twelve Amateur Athletic Association championships, and his time for the mile - 4 min. 12 $\frac{1}{2}$ sec. - stood as the world's record for thirty-seven years. The amateur championships he won were the m. and 4 m., each four times, and the 1 m. and 10 m. each twice. He turned professional in 1884, and his famous record in the mile was made against W. Cummings of Paisley, at Lillie Bridge in 1886. In 1882 and 1884 he also won the national cross-country titles. In all he won more than 1000 cups and medals. In his prime, tall, slim, and dark haired. Although, on comparative times, Wooderson in 1937 did the mile in 4 min. 6 sec., G. had not the same advantages from artificial aids; he had little help from the trainer, he had no masseur, tracks were slow and badly laid, and there was no scientific dieting.

George Cross, hono. incurred in 1940 to reward the performance of deeds of valour by civilians, both men and women. It ranks with and immediately after the Victoria Cross, and is worn before the insignia of all orders and before all other decorations. It takes the place of the medal of the Order of the Brit. Empire for Gallantry (E.G.M.), holders of the E.G.M. receiving the G. C. in substitution. There is a small military div. of the Cross to permit its award to members of the fighting services who perform acts coming within the terms of the warrant. Among the first recipients were persons who rendered heroic service during Ger. air raids on Britain. Another notable award was to the Is. of Malta in recognition of its gallant resistance in the Second World War.

George, Lake: 1. Lake in the E part of the state of New York, U.S.A., in the Adirondack Mts., connected with Lake Champlain by Ticonderoga Creek, famed for its beautiful scenery, which makes it a favourite summer resort. It is about 31 m. long, and from 2 to 4 m. wide, and is fed by brooks and springs. 2. Lake in New S. Wales, Australia, 25 m. S.W. of Goulburn. It is a salt-water lake, 25 m. long and 8 m. broad, and is 2129 ft. above the level of the sea. 3. Port in Cape Colony, S. Africa, pop. 3506. 4. Lake in central Africa, formerly known as Albert Edward Nyanza.

Georgetown: 1. Tn., now included with in the limits of Washington, but formerly in the dist. of Columbia. Many famous people have lived here, amongst them being Francis Scott Key, J. H. Payne, and J. M. Mason. It was settled in the latter part of the seventeenth century, chartered in 1789, and annexed to Washington in 1878. In the early days it was an important social centre. It has a number of large flour mills. 2. The cap. of Brit.

Guaia and its chief port, situated on the Demarara R. The chief exports are sugar, coffee, and rum. There are two foundries, a dry dock, and factories for the manuf. of rice, cigars, chocolate, candies, aerated water, ice, etc. A modern system of sewage disposal, and electricity was installed in 1929. It is connected by rail and ferry with New Amsterdam and the W. coast, and by steamer with the coastal dists. and rvs. Owing to the swampy nature of the surrounding dist., the climate is somewhat unhealthy, though it has much improved of late years. Artesian wells supply the city with water. The (pre-1945) city was well built on low, flat land, and most of the houses were made of wood. The tn. was devastated by a fire on Feb. 23, 1945. Fed by inflammable chemicals the fire demolished, in Church Street, the buildings of the G. Chamber of Commerce, the Tourist Board, the library of the Royal Agric. and Commercial Society, the Natural Hist. Museum, the G. Club and Assembly Rooms, and some gov. offices; and in High Street, the General Post Office, Broadcasting Station, Barclay's Bank, and the Royal Bank of Canada. The heart of the city's business section was wiped out. It is an unhappy coincidence that two similar configurations in 1864 swept much the same section of the tn. There was, however, only one life lost in the fire of 1945. The damage was estimated at £2,000,000. Pop. 54,500. 3. Municipality in Penang Is., off the W. coast of the Malay Peninsula. Next to Singapore G. is the chief port of the Straits Settlements. It is fortified, and has a large harbour. Pop. 165,000. 4. Tn. in Cape Prov. off the Cape of Good Hope, laid out in accordance with the ant. Dutch modelling. Pop. (white) 7000. 5. City and the co. seat of G. co., S. Carolina, U.S.A. It is a seaport of some importance, and has steamship communication with New York. It is served by the Seaboard Airline railway, and by steamer service. It has turpentine distilleries, and exports rice, cotton, fish, lumber, etc. G. is famous as the landing-place of Lafayette on his first visit to the U.S.A., and the tn. was settled about 1700, incorporated in 1801, and chartered as a city in 1895. Pop. 5500.

Georgia (or Sakartvelo), former kingdom of Transcaucasia, which existed historically for more than 2000 years, comprising the ter. S. of the Caucasian Mts., between the Black and Caspian Seas. Its native and earliest name was Kartli; Vrastav is the Armenian name, and Gruzia the Russian. It includes the two autonomous republics of Abkhazia and Adjaria, and an autonomous region, S. Ossetia. Prior to the First World War G. was divided into the Russian govs. of Tiflis, Kutaisi, Elisavetpol, Baku, and Erivan. G. was conquered by Alexander the Great, but after his death the Georgians succeeded in establishing themselves as an independent people with a gov. of their own, and they managed to maintain their political position as a state until the beginning of the nineteenth century, in

spite of being conquered and made tributary sev. times by the Arabian caliphs, and by Persia. It was annexed by Russia in 1801 in violation of the treaty of alliance of 1783. In 1801 G. was converted into a Russian prov. Many of the Georgians are at the present day Moslem, though they were converted to Christianity early in the fourth century (A.D. 318). Their language forms a very interesting intermediate link between the Indo-European languages and the mono-syllabic tongues of E. Asia. It resembles them chiefly in its phonetic system and presents great facilities for composition, the laws of which are very regular. Georgian is written in a native alphabet, obviously based on the Armenian, and there are sev. varieties of the language. The Georgian trans. of the Bible dates from the eighth century, and is the most anc't. work known to exist in the language. The curious poem entitled *The Man clothed in the Panther's Skin*, attributed to Rustevol, who lived during the eleventh century, is the next most important composition, whilst others of note are national epics and prose romances. Other than these, the great bulk of Georgian literature consists of eccles. writings, national codes and chronicles, and hymns, both sacred and profane. The Georgians proper number about 400,000, and together with the highland Georgians (consisting of the Khevsurs, Pshavians, and Tushes), Imeritians, Gurians, Mingrelians, Lazies, etc., they make up a total of about 1,400,000. Their race is distinguished by some excellent qualities, and they are specially noted for great personal courage, and a passionate love of music. Physically, they are a fine athletic race, and their women are noted for their beauty. Before their incorporation with the Russian empire, the social organisation rested on a highly aristocratic basis, but these relations were modified to a considerable extent, and a more sharply defined middle class of merchants, artisans, and traders was developed. The power of life and death, formerly freely exercised by the nobles over their serfs, had been abolished before the Russian revolution. Under the tsars G. was divided between the provs. of Tiflis and Kutaisi. After the 1917 revolution civil war prevailed until 1921, when G. became an Autonomous Socialist Soviet Republic in the Transcaucasian Federation. The mass of the pop. is illiterate and agriculture is the chief occupation. Cotton and tobacco are grown, also bamboo and medicinal plants. The cultivation of tea has increased of late. The problem of irrigation is very difficult. The country is heavily timbered, but the industry is little developed owing to the lack of communications and the unsuitability of the streams for floating logs. The chief mineral product is manganese and the manganese ore beds are among the richest in the world, more than one-half of the world's supply being derived in 1914 from the Chilatry mines in the dist. of Sharopansky. Abundant coal, but of poor quality, is mined, and naphtha exists;

mineral springs are numerous. The chief industries are tobacco, leather, and bricks, also the weaving of carpets and silks. Wine is produced in considerable quantities. There are 970 m. of railway, the trunk line connecting the Black Sea ports of Poti and Batum, on the Caspian. Batum and Baku are also connected by a petroleum pipe line. The cap. is Tiflis. Area 37,500 sq. m. Pop. (including Armenians, Russians, Tartars, etc.) (1939) 3,512,200.

Georgia. One of the original thirteen states of the U.S.A. It is a S. Atlantic state, bounded on the N. by Tennessee and N. Carolina, on the E. by S. Carolina and the Atlantic Ocean, on the S. by Florida, and on the W. by Alabama. The total area is 58,800 sq. m., of which 300 sq. m. are water. The surface of the state is divided between highlands and lowlands, the Blue Ridge Mts. terminating in the N. part of the state. Its drainage system is extensive, the prin. rvs. being the Savannah, the Altamaha, the Chattahoochee, and the Flint. The climate of G. shows a wide range of temp., and differs considerably in the various localities. In S. G. the climate is similar to that of N. Florida. The winters and summers are, however, free from extremes, and on the whole the climate is temperate. The greatest rainfall occurs in the extreme N., and the smallest in the E. G. is also notable for its variety of soils. In the N. part sands and clay predominate, but in the extreme N.W. the soil possesses great fertility, being of a loamy character. By far the greatest variety is found in the coastal plain region; here abound red clay, grey sandy soils, and a subsoil of yellow loam. The flora and fauna of G. have no distinctive features, but in mineral resources it shows as great a variety as in its climate and soils. The most important of these is stone. The marble industry, too, has steadily grown in importance during the past years, and the G. marble has gained a reputation throughout the U.S.A. Other mineral products are silver, copper, asbestos, talc, mica, slate, limestone, cement, etc. Coal is not extensively found. Gold was found in White County in 1829, and even diamonds have been discovered, though not exploited. The fisheries of G. are important, oysters and shad constituting the bulk of the catch. The leading industry of the state used to be agriculture. The products are extremely diversified, and with the exception of the tropical fruits of California and Florida, G. can cultivate almost everything produced by the U.S.A. The prin. cereals grown are corn, wheat, oats, and rice. G. ranks second among the cotton-growing commonwealths, and has an enormous cotton-growing area. The growth of sugar-cane is increasing. The chief industry is cotton goods; others are lumber, fertiliser, food products, printing, and publishing. Manufacturing has now passed agriculture in importance owing to the vast development of water-power. Since 1916 education has been compulsory. There are elementary schools, high schools, and normal schools,

with separate schools for whites and Negroes. The cap. is Atlanta and the chief port Savannah. G. was the last of the Eng. colonies to be estab. in America, and is called after George II. of Great Britain. It was founded by Oglethorpe as a refuge for poor debtors. It took an important part in the Revolutionary war. In 1861 it passed the ordinance of secession and in 1870 was re-admitted into the Union. Pop. 3,123,000. Prin. cities are Atlanta 302,200, Savannah 95,900, Augusta 65,900, Macon 57,800, Columbus 53,200. See C. Howell, *History of Georgia*, 1926; E. M. Coulter, *A Short History of Georgia*, 1933; and A. B. Saye, *New Vierpoints in Georgian History*, 1913.

Georgia, Gulf of. This strait separates Vancouver Is. from Brit. Columbia; it is 30 m. broad and about 250 m. long. It meets the Pacific Ocean at Queen Charlotte Sound on the N. and Juan de Fuca Strait on the S.

Georgian Architecture. The characteristic features of the Georgian (and Queen Anne) houses are the sash-windows symmetrically arranged with wooden bars, the central doorway with consoles, entablature, and pediments; a boldly projecting console cornice protecting the walls from rain, and generally a plain hipped roof, with simple dormer windows. A good illustration is No. 10 Downing Street, Whitehall. Generally the smaller Georgian house is set back from the road behind simple iron railings, and shows a straight, two-storeyed front raised upon a basement flat. Blenheim, designed by Vanbrugh, and Somerset House, by Chambers, are good examples of this style.

Georgian Bay constitutes the N.E. section of Lake Huron in N. America, and is divided from the lake by Manitoulin Is. and the peninsula containing the two cos. Grey and Bruce. The bay is nearly 100 m. long and 50 m. broad. It is fed by many rvs., chief among which are the Rv. French, Maganawan, and Muskoka. The S. portion of the bay is watered by the R. Nottawasaga. The Trent Valley Canal connects the bay with the bay of Quinte and Lake Ontario.

Gephyrea, name given to a large class of marine worms, which includes the four orders Sipunculoidea, Priapuloidea, Echiuroidea, and Epiphethosomatoidae. The Sipunculoidea are elongated and vermiciform in shape, and live in the ooze and sand at the bottom of the sea; occasionally they bore into coral rock; *Phymosoma* and *Sipunculus* are the most important genera. The Priapuloidea contain the two genera *Priapus* and *Halicryptus*, cylindrical animals with the mouth at one end and the anus at the other. The Echiuroidea are distinguished by the presence of a long contractile dorsal outgrowth, forming the proboscis. The Epiphethosomatoidae contain a single family which are remarkable for their long, tubular proboscis, and for a series of pores which lie on each side of the body.

Gera, tn. in Germany, on the White Elster, 35 m. S.W. of Leipzig. It has broad

streets and fine buildings, with a castle and an old municipal hall. Manufs. woolens, machinery, and musical instruments. Pop. 84,000.

Geraldton, tn. 230 m. from Perth in W. Australia, situated on Campion Bay. It is noted as being the port for the Murchison goldfield. It has a good harbour; the chief exports are gold, copper, sandalwood, and wool. Pop. 5900.

Gérando, Joseph Marie de, see Degrande-Ando, Baron.

Geranium, genus of plants belonging to the natural order Geraniaceæ. Chiefly ann. or perennial herbaceous plants with palmately lobed leaves and regular five-petaled flowers. A characteristic elongated beak-like process attached to the ovary gives the genus the popular name of "Crane's-bill." The Gs. are widely distributed, species being found in all climates; sev. occur naturally in the Brit. Is., of which perhaps the most familiar is Herb Robert, or Stinking Crane's-bill, from its pungent odour. The common garden Gs. are not correctly so called, being really members of the genus *Pelargonium*, which, however, is also included in the order Geraniaceæ.

Gérard, Étienne Maurice, Comte (1773-1852), celebrated Fr. general and marshal of France under Louis-Philippe. He served as a volunteer under Dumouriez and Jourdan, became captain in 1794, and accompanied Bernadotte to Vienna as aide-de-camp in 1798. He was present at Jena (1806), Erfurt (1806), and commanded the Saxon cavalry at Wagram (1809). G. first won fame by his splendid charge at Austerlitz in 1805. He went to Portugal from 1810 to 1811, and then did great service to France during Napoleon's Russian campaign, helping to save the rearguard of the Grande Armée during the retreat, 1812. He distinguished himself at Bautzen in 1813, was wounded at Leipzig, but fought at La Rothière and Montereau. Joining Napoleon after his escape from Elba, G. fought at Ligny in 1815 with Grouchy. Louis XVIII. named him Grand Cross of the Légion d'Honneur. G. was a member of the Chamber of Deputies in 1822 and 1827, took part in the revolution of 1830, besieged and took Antwerp, 1832, and succeeded Mortier as grand chancellor of the Légion d'Honneur, 1835. Napoleon III. made him senator in 1852.

Gérard, François Pascal, Baron (1770-1837), Fr. painter, b. in Rome. He entered the Pension du Roi at Paris at the age of twelve, and from there went to the studios of Pajou, the sculptor, and Brenet, the painter, whom he left shortly to study under David. He competed for the Prix de Rome in 1789, but was unsuccessful. Two years later he again presented himself, but his father's death prevented the completion of his work. He then went to Rome for a year, but returned to Paris in 1791, and obtained employment under his former master, David. In 1796 he painted his famous "Bélaïsare," and the following year "Psyché et l'Amour." From 1808 to 1810 he exhibited quite a

number of pictures at the Fr. Salon. He is best remembered by his portraits, notably of Napoleon, Talleyrand, Mme de Staél, and Mme Récamier. See —. Delécluze, *Louis David, son école et son temps*, 1855.

Gerard, James Watson, Amer. lawyer and ambas., b. 1867, at Genesco, New York; his father was a lawyer and historical writer. G. graduated at Columbia Univ. in 1890. In 1892 he was admitted to the Bar, and began practice in New York city. He was chairman of the Democratic campaign committee of New York co. for four years. Elected associate justice of supreme court of New York for term 1908-21, but resigned Sept. 9, 1913, in order to become U.S. ambas. to Germany. In his first year in Berlin he came to the conclusion that Germany was trying for a *rapprochement* with Great Britain as against the Monroe doctrine of U.S.A. He formed and retained a high opinion of the Crown Prince Friedrich Wilhelm (q.v.); but he bears witness to the intolerable arrogance of the Prussian military caste, who, he believed, hurried the preparations for a war because of the beginning of an anti-militarist movement in Germany after the Zabern affair. On the eve of the First World War he wrote to the Brit. ambas. offering mediation by the U.S.A., but his letter was never answered. Before the entry of America into the war G. was most energetic in seeing to the interests of oppressed Brit. prisoners in Germany. He gives a detailed and most interesting account of his experiences in *My Four Years in Germany* (1917), written when he had resumed practice in New York. He has also written *Fare to Face with Kaiserism* (1918). He holds the Brit. distinction of K.C.M.G.

Gérard, Jean Ignace, see GRANDVILLE.

Gerard, John (1545-1612), Eng. herballist and writer on gardening. He lived for some time at Holborn, London, keeping a large physic garden there, and practising as a barber-surgeon. He kept Lord Burghley's gardens for over twenty years. In 1586 G. pub. his *Catalogus arborum fruticum ac plantarum... in horto Joannis Gerardi...* (1100 varieties). His *Herball*, or *Generall Historie of Plantes* (1597), was based on Dodoens's *Stirpium historiae pemptades* (1583). An enlarged ed. was issued by Thomas Johnson in 1633. G. became master of the Company of Barber-Surgeons, 1607. See M. Woodward, *Gerard's Herball*, 1636; E. Arber (editor), *A Transcript of the Registers of the Company of Stationers of London*, in. 21, 1875; and Alice Tudor, *A Little Book of Healing Herbs, gathered from an Old Herball*, 1927.

Gérardmer, or Géromé, health resort and tu. of Vosges, France, 18 m. from Saint-Dié, on G. Lake, near Lakes Longemer and Retournemer. It was named in honour of Gérard of Alsace, who built a tower by the lake (c. 1070). Noted for its picturesque position, it is a tourist centre. It has manufs. of linen, household utensils, and hemp, and large trade in Géromé cheese. Part of the tu. was

destroyed by fire in the Second World War. Pop. (com.) 8500.

Gerard of Cremona (1114-87), medieval translator of Ptolemy's astronomy. He studied anct. wisdom in the Sp. and Muslim schools of Toledo, and having acquired a knowledge of Arabic, devoted the remainder of his life to the making of Lat. trans. from its literature. His most celebrated work is the trans. of Ptolemy's *Almagest*. He is also said to have trans. about sixty-six other treatises. He d. at Cremona in Lombardy.

Gerasa (Γέρασα, modern Jarash), anct. city of the Decapolis, Palestine, 56 m. from Jerusalem. It is among the mts. of Gillead, about 20 m. E. of Jordan. Grove identifies it with Ramoth-gilead. In 83 B.C. it was captured by Alexander Jannaeus of the Maccabean line, and rebuilt by the Romans, 65 B.C. (i. was very important in the time of the Antonines (A.D. 138-80). It was a bishop's see in early Christian times. It cannot be the 'country of the Gerasenes' (see Wilson, *Recorver of Jerusalem*, p. 369). The ruined forum, colonnaded streets, theatres, and temple probably date from the second and third centuries A.D. (see photographs by Palestine Exploration Fund, 1867). See GADIRAH.

Gerfalcon, see FALCON.

Gerhardt, Karl Friedrich (Charles Frederic) (1816-56), famous Fr. chemist, native of Straßburg. He studied under Liebig at Giessen, and with Chevreul, and trans. sev. works of Berzelius and Liebig. He went to Paris, and in collaboration with Laurent and Cahours contributed to the *Annales de chimie et de physique*. With Cahours he wrote a memoir on essential oils, embodying new theories. G. was prof. at Montpellier, 1844-18, and then returned to Paris, the greater part of his work being done in that city. In 1855 he became prof. of chem. at Strasburg. His chief works are *Précis de chimie organique* (1844-46); *Introduction à l'étude de la chimie par le système unitaire* (1848); *Précis d'analyse chimique* (1855); *Traité de chimie organique* (1853-56). See Cahours, *Notice sur Charles Gerhardt*, 1856, and E. Grimaux, *Charles Gerhardt, sa vie, son œuvre, sa correspondance*, 1900.

Gerhardt, Paulus (Paul) (1607-76), great Ger. hymn-writer of Saxony, second only to Luther. He studied at Wittenberg, became pastor at Mittenwalde (1651), in Berlin (1657-67). He removed to Lubbon, 1669, and was pastor there in the Spreewald till his death. G. supported the Lutherans in their controversies with the reformed churches. Among his most celebrated hymns are 'Nun ruhen alle Walder,' 'Wach auf mein Herz, und singe' (1648); 'Warum sollt ich mich dann grämen?' (1653); 'Besiegle du deino Wege' (1656) (Wesley's 'Commit thou all thy ways'); 'O Haupt voll Blut und Wunden' (Alexander's 'O sacred head once wounded'). His *Collected Hymns* first appeared 1667. A good ed. is that of A. Ebelling (1908). See F. Roth, *P. Gerhardt*, 1832 (new ed. by Lommatsch, 1893); K. Langbocker, *P. Gerhardt's Leben und Lieder*, 1841; J. Kelly (trans.), *Gerhardt's*

Spiritual Songs, 1867; and studies by P. Wernlo, 1907; H. Petrich, 1914; and E. Kochs, 1926.

Géricault, Jean Louis André Théodore (1791–1824), Fr. painter, leader of the Romantique as opposed to the Classical school. He was pupil of Vernet (1808) and Gérin (1810). G. spent much time in Versailles, and entered the army for a time (c. 1814). He soon returned to his art, visiting Italy (1816–18) and England in 1819. 'Le Radeau de la Méduse' (1819), his most famous work, is now in the Louvre. The Wallace Collection, London, has his 'Equestrian Portrait of the Prince Regent'. His horses are especially fine. Other pictures are 'A Cavalry Officer on Horseback' (1812); 'Wounded Cuirassier' (1814), and studies for a picture of a horse-race in the Corso during Carnival. G. also produced a few bronzes and wax-sketches. See E. Coquatrix, *Géricault, prose et vers*, 1846; C. Clément, *Géricault . . .*, 1868; and lives by L. Rosenthal, 1905, and L. Delteil, 1924; also W. Brownell, *French Art, Classic and Contemporary*, 1901.

Gerizim and Ebal, in scriptural geography two hills of Samaria, Palestine. The former (c. 2850 ft. high) stands opposite the latter (c. 3000 ft. high), which is on the N. side of the valley in which lies Nablus (anc. Shechem). The curse for disobedience to the law was pronounced from Mt. Ebal, the blessing for obedience from Mt. Gerizim (Joshua viii. 33). After the conquest of Canaan Joshua erected an altar to Jehovah on Ebal (modern Arabic name *Jebel El-Samayyeh*). The Samaritans built their temple on it.

Germ, see **BACTERIA**; **BIOLOGY**.

German, Sir Edward (Edward German Jones) (1862–1936), Eng. musical composer, b. in Shropshire, educated at Bridgwater School, Chester. He entered the Royal Academy of Music, 1880, leaving it as associate, 1887. He was made a fellow, 1895. His operetta, *The Rival Ports*, was first produced at St. George's Hall, 1886, and revived by the pupils of the Academy, 1901. In 1889 G. became director of music at the *Globe Theatre*, London, under Mansfield's management. His incidental music to *Richard III.* (1891) was the first of a series of similar compositions for Shakespearian and other plays. *Henry VIII.* appeared at the Lyceum, 1892—the three dances performed during Wolsey's reception at York Place (Act 1) becoming immensely popular; *Romeo and Juliet* (1895); *As You Like It* (St. James's Theatre) (1896); symphonic poem, *Hamlet* (1897); and *Much Ado About Nothing* (1898). G. also wrote two symphonies, in E. minor (*Crystul Palace*) (1890) and A. minor (1893). He conducted at many great musical festivals. Other works are *Nell Gwynn* (1900); *The Emerald Isle* (finished for Sullivan) (1901); *Merrie England* (1902); *The Princess of Kensington* (1903); *Just So Song Book* (with Kipling) (1904); *Tom Jones* (1907); and *Fallen Fairies* (with Gilbert) (1909). His coronation march and hymn were performed at Westminster at the coronation of George V., 1911. The *Willow Song* was per-

formed at the R.A.M. Centenary in London in 1922. He wrote numerous songs, part songs, and duets. The melodian and the scholar were happily combined in G. His music is of the school of Sullivan, but has a character of its own, and apart from his symphonic works, has a strong O.E. flavour and a spring-time rhythm. See life by W. H. Scott, 1932.

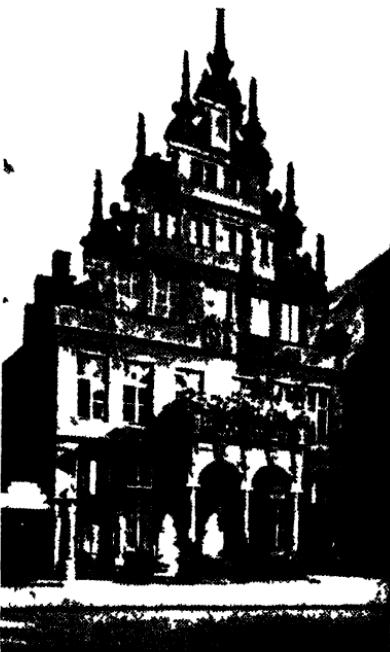
German Art. Germany has never occupied a leading position, comparable to that of Italy or France, in the hist. of visual art in W. Europe, but the works produced there have an interesting individual character, and the best of them are acknowledged to approach to the masterpieces of more famous schools.

The medieval art of Germany developed out of that of the Carolingian Empire of the ninth century. Carolingian art itself was a W. European rather than a specifically Ger. phenomenon, but it has left some monuments on Ger. soil, of which the most important is the octagonal domed chapel, which still forms the nucleus of the cathedral at Aachen, the central seat of Charlemagne's Gov. A specifically national style first appeared in the Ottonian period during the latter part of the tenth and the first half of the eleventh century. This was a period of great activity in architecture and MS. illumination and, to a lesser extent, in sculpture. The churches of this period were built in the Romanesque style, with round-headed arches, and were elaborately decorated on the outside with arceding. A peculiar feature of their plan was the frequent presence of an apse at the W. as well as at the E. end of the church, instead of the doorway usual in that position in the rest of Europe. Among the most famous surviving buildings of this period are the abbey of Gernrode and the cathedrals of Mainz, Speyer, and Worms in the Rhineland, and the church of St. Michael at Hildesheim. The monastery of Reichenau was specially celebrated for the production of illuminated MSS., of which a fine example is the Gospels of Otto III, now in Munich, executed about the year 1000. The finest surviving sculptures are the bronze doors of the cathedral of Hildesheim executed in 1015. Both the painting and the sculpture of this period, though based on Rom. and Carolingian models, are distinguished by a vigour of emotional expression that is characteristically Ger. The twelfth century was a period of less artistic activity, though some fine churches were built such as that of the Apostles at Cologne. The rock carving of the Deposition at the Externsteine, near Detmold, executed in 1215, is an extraordinarily moving composition. Towards the end of the first quarter of the thirteenth century the Gothic style of architecture began to reach Germany from France, and is first seen in such transitional works as the nave of the church of St. Gereon at Cologne and the cathedral at Münster, begun in 1225. One of the earliest fully Gothic churches in Germany is that of St. Elisabeth at Marburg, begun in 1233, which shows

already the most striking feature of Ger Gothic construction, the aisles being carried to the same height as the nave. The resulting type of church is called a 'hall church' (*Hallenkirche*) and Ger Gothic churches generally conform to it. Cologne Cathedral, begun in 1248 but not finally finished until 1880 is of the more familiar type with triforium and clerestory. In N Germany the absence of suitable local building stone led to interesting developments of Gothic construction in brick especially in the great ports of the Hanseatic League like Lübeck while further S a tendency to over elaboration in the stonework already noticeable in the earlier parts of Cologne Cathedral steadily increased throughout the fourteenth and fifteenth centuries and culminated in the Late Gothic style of the beginning of the sixteenth. A characteristic example of this elaborate style is the cathedral at Ulm, begun in 1377 but, like Cologne, not finished until the nineteenth century. There was also a revival of sculpture in the thirteenth century contemporary with the first introduction of the Gothic style in architecture but itself representing rather a last flowering of the Romanesque. The most important surviving monuments of this style are the series of figures decorating the cathedrals of Freiburg in Saxony, Bamberg, Naumburg, Strasburg, Paderborn and Münster dating from between 1230 and 1270. This grand monumental style was succeeded in the fourteenth century by the pretty but over elaborate 'international style' of Gothic common to the whole of Europe at that period and an individual Ger style in sculpture hardly reasserted itself before the second half of the fifteenth century.

There are no monuments of painting surviving comparable in importance to the great sculptured decorations of the thirteenth century, but in the later fourteenth and earlier fifteenth century the 'international style' was developed in interesting and individual ways by such artists as Bertram von Minden and Konrad von Soest in Westphalia, Stephan Lochner in Cologne, and Meister Francke in Hildesheim whose work prepared the way for the great movement of the end of the fifteenth and the beginning of the sixteenth century. This period is justly the most famous in the list of G A. The leading sculptors were Veit Stoß (1445-1533) and Peter Vischer the elder (1459-1529), both of Nuremberg, and Tilman Riemenschneider (1460-1531) of Würzburg, all of whom combine a mannered angular development of Gothic drapery with greatly increased freedom of movement and naturalism of expression. Vischer is especially famous for his bronze statues on the tomb of the Emperor Maximilian at Innsbruck (1513). In painting we find a parallel development in the work of Martin Schongauer (d. 1491) who is well known as an engraver, and in whose work the influence of the school of the Van Eycks is evident. The works of the artists of the next generation show a greater originality of style, and it is on

them that the claim of Germany to have produced a school of painting of major European importance must chiefly rest. Matthias Grünewald (1470/80-1528) is an expressionist painter of unsurpassed emotional force, but the greatest figure is Albrecht Dürer of Nuremberg (1471-1528) unrivalled in his country as painter, engraver and draughtsman. Dürer twice visited Venice and was influenced by the developed Renaissance art which he saw there. This influence was mainly confined to his paintings and was not wholly



THE STADTWINHALT OF MÜNSTER
A masterpiece of the Renaissance style
(thirteenth to fifteenth century)

beneficial as may be seen in his two panels of apostles in Munich. He is at his best as a portrait painter and as an engraver and draughtsman where he combines clarity of design with rich and exquisite detail. His water colour sketches are remarkable for the breadth of handling. Tiedt young contemporaries of Dürer's were Hans Baldung Grien (1475/80-1545) and Albrecht Altdorfer (c. 1480-1538), while Lucas Cranach the elder (1472-1553), a painter of delightful mythological pictures and excellent portraits carries to the middle of the century something of the spirit of its opening years. The troubles of the Reformation brought about a decay of artistic activity after

about 1530. In architecture a mannered style of Renaissance decoration, of Flemish inspiration, supersedes the elaborate late Gothic, but in plan and construction buildings retain their essentially Gothic character, as may be seen in the churches of Stadthagen and Wolfenbuttel, which date from the early seventeenth century. In sculpture there are no figures of outstanding importance. In painting there are some good local schools of portraiture, but the only really important artist is Adam Elsheimer of Frankfurt (1578-1610), who spent the last decade of his life in Rome. The Thirty Years war checked even this reduced activity and the art that we find in the second half of the seventeenth century is mainly a court art, based on imported Baroque models and with little connection with anything that had gone before. Recovery from the Thirty Years war was slow, and it is not until the end of the century that Germany produced an architect and sculptor of note in Andreas Schlüter (1661-1714), who built part of the Schloss at Berlin and made the equestrian statue of the Great Elector there.

During the first half of the eighteenth century a development of the Baroque style took place in S. Germany in which architecture, sculpture, and painting were combined to produce the most striking theatrical effects. Though the origins of this style are to be found in Italy it represents an important and original German contribution to the Baroque movement. The prin. architects in this style were the brothers Asam of Munich. A rather more sober handling of the Baroque distinguishes the work of Balthazar Neumann (1688-1753), architect of the Bishops' Palace at Würzburg. The eighteenth century produced no very notable native painting. The most important painter working in Germany during the first half of the century, Anthony Pevsner (1683-1757), was a Frenchman, and the great Venetian, J. B. Tiepolo, worked some years at Wurzburg in the middle of the century. Anton Italien Mengs of Dresden (1728-79), the most prominent artist of the second half of the century, worked much in Italy and based his style on the It. painters of the High Renaissance. At the end of the century the Neo-Classical style was enthusiastically adopted in Germany and retained its popularity until the middle of the nineteenth century. An early and famous architectural example is the Brandenburg Tor (Gate) in Berlin built at the end of the eighteenth century by J. G. Langhans (1733-1808), but its most important exponent was Karl Friedrich Schinkel (1781-1841). In the middle of the nineteenth century there was the same revival of Gothic architecture in Germany as in other European countries, but perhaps because in Germany the Gothic spirit had never wholly died out such limitations were often more lively and successful there than elsewhere. Many Gothic churches left unfinished in the sixteenth century were completed at this period. In the present century, until

1933, Germany held a leading position in the development of a new style of architecture, based on the possibilities of new constructional methods, with the work of such architects as Walter Gropius (b. 1883) and Erich Mendelsohn (b. 1887). Official Nazi architecture rather favoured a return to the Neo-Classical style of the early nineteenth century.

In sculpture the Neo-Classical style is found in the works of Gottfried Schadow (1764-1850). In the second half of the century Adolf Hildebrand (1847-1921) based his style on a wider traditionalism, drawing inspiration from the great masters of the Renaissance as well as from classical models. More interesting movements are found in the painting of the nineteenth century. Contemporary with the Neo-Classical style in architecture and sculpture was the Romantic movement in painting which was distinguished by a clarity of form which it owed to Neo-Classical influence. At the beginning of this movement stands a group of painters active in Rome, and known as the Nazarenes, who in their aims and methods in some respects anticipated the Eng. pro-Itaphelite Brotherhood. Their leader was Friedrich Overbeck (1783-1869). Philip Otto Runge of Hamburg (1777-1810) followed a similar line, and but for his early death would have probably occupied a dominating position. More frankly Romantic was the work of the great landscape painter Caspar David Friedrich (1774-1840). The Romantic style was carried on in the next generation by Ludwig Richter (1803-84), Moritz von Schwind (1804-71), and Alfred Rethel (1816-59). A more straightforward realist painter was Adolf von Menzel (1815-1905), while a richer and more impressionistic style of painting distinguished the Romanticism of Arnold Böcklin (1827-1901), Anselm Feuerbach (1829-80), and Hans von Marées (1837-87). Franz von Lenbach (1838-1904) and Wilhelm Liebel (1844-1900) were portrait painters of distinction. The influence of the Fr. Impressionist movement can be seen in the work of Max Liebermann (1847-1935), while post-impressionism was reflected in the Expressionism of Paula Modersohn-Becker (1876-1907) and Franz Marc (1880-1916). During the period between the First World War and the advent of Hitler German artists tried a bewildering variety of experiments both in sculpture and painting, ranging from revival of primitive styles to complete abstraction, but in no direction was the achievement outstanding. The policy of Dr. Goebbels favoured a negative academic traditionalism or an hysterically expressive propaganda. See G. Dehio, *Geschichte der deutschen Kunst*, 1919-34; W. Museler, *Deutsche Kunst im Wandel der Seiten* Berlin, 1938; H. Pleton, *Early German Art and its Origins*, 1939; and *Works of Art in Germany (British Zone of Occupation)*; *Losses and Survivals in the War* (H.M.S.O.), 1946.

German Baptist Brethren Religious body founded in Germany during the seventeenth century by Andrew Black of

Schwartzen, whose doctrine and discipline were based upon literal interpretation of the O.T. and N.T. Owing apparently to the unpopularity of some of their opinions they experienced many difficulties and hardships in Europe, but their emigrant members were able to obtain greater freedom and security in America, where many of them settled during the early part of the eighteenth century. Here they became known as the Dunkers, or Tunkers (from *tunkēn*, to dip), adult baptism being one of their important rites. They have always been careful to observe certain of the N.T. customs, which other Christian churches regard as unimportant or as being local customs of Palestine. These include the 'washing of feet' and the 'salutation with a holy kiss.' The main body has now a membership of about 120,000. The G. B. D. came into some prominence during the First World War owing to their belief in the doctrine of non-resistance. Faith-healing is also a prominent teaching in their church, but they are not so well known for this tenet as Amer. bodies of more recent origin.

German *Bearhound*, see GREAT DANE.
German *Bulldog*, see BOXER.

German *Catholics*, name given to a religious sect in Germany, who broke away from the Rom. Catholic Church in 1844, under the leadership of Rouge, an ex-priest of Silesia, and Czerski, a priest of Schneidemühl, who seceded from the Church of Rome and formed a congregation of Christian Apostolic Catholics. Their first general council was held at Leipzig in 1845. The essentials of belief were restricted to a few doctrines, and the scripture was laid down to be the sole rule of faith, no external authority being allowed to interfere with its free interpretation. By the end of the year 1845 the G. C. had some 300 congregations. Internal dissension, however, soon set in, and strong measures were taken against the G. C. They were expelled from Austria, and their clergy were not recognised in Prussia. Many of the congregations either dissolved or returned to Rome, and in 1859 the majority joined the free-thinking association known as the Free Congregations. Six years later this council refused to commit itself to the belief in a personal God. The G. C. movement may be said to have been superseded by the Old Catholics.

German Colonies. Under the treaty of Versailles (q.v.), 1919, Germany surrendered all her overseas colonies and protectorates. Ger. E. Africa was ceded to Britain, being renamed Tanganyika Ter., Ger. S.W. Africa went to the Union of S. Africa; Cameroon and Togoland were jointly partitioned between France and Britain (see AFRICA; CAMEROONS; TOGO-LAND). The Ger. base of Kiau-Chao and other interests in Shantung, together with the Ger. Pacific Is. N. of the equator, were ceded to Japan; the Ger. portion of Samoa to N. Zealand, and Ger. New Guinea and the remainder of the possessions in the Pacific to Australia. In addition Germany renounced all her special rights and privileges in China, Siam, Morocco, Liberia,

and Egypt. Conformably with the development of a sense of common responsibility for the welfare of mankind, these colonies were received by the victorious Allies not as absolute, sovereign possessions, but as mandated ter. In this way the administration of Ger. colonies in S. Africa was entrusted to Britain, France, and S. Africa; the Pacific Is. to Australia, N. Zealand, and Japan. See also under the various countries named.

Germanander, name given to the Brit. species of *Teucrium*, a genus of labiate plants. The wood G. is *T. scorodonia*; the wild G., *T. Chamaedrys*.

German Dogge, see GREAT DANE.

German East Africa. Formerly a Ger. colony in Equatorial E. Africa, and Germany's largest dependency, this area, which is bounded by Uganda, Victoria Nyanza, and Konya Colony on the N., the Indian Ocean on the E., Portuguese E. Africa and Lake Nyassa on the S., and N. Rhodesia, Lake Tanganyika, and Belgian Congo on the W., was conquered by the Allies during the First World War. It then became known as Tanganyika Ter., and, with the exception of the dists. of Ruanda and Urundi, which were joined to the Belgian Congo, and a small dist. in the S., which was added to Portuguese E. Africa, passed into the possession of Great Britain, under the mandate of the League of Nations. See under TANGANYIKA TERRITORY, and for the campaign see AFRICA, GERMAN EAST, CAMPAIGN (FIRST WORLD WAR).

Germanic Laws. The designation of the systems of law evolved and codified by the prin. Teutonic tribes on the estab. of native kingdoms on the retirement of the Roms. from Germany. The codes date back to the fifth and sixth centuries, and show in general a blend of native tribal law and of Rom. law. The following tribes possessed coded laws: Alemans, Bavarians, Burgundians, Frisians, Saxons, Thuringians, and Visigoths. The codes were framed in the Lat. language with scraps of barbaric legal terminology. The need for codification seems to have arisen from the difficulties experienced by the Roms. in endeavouring to administer their system of law with various tribes, each possessing a system of its own.

Germanicus, *Cæsar* (*Tiberius Drusus Nero*) (c. 15 B.C.-A.D. 19), famous Rom. general, son of Nero Claudius Drusus and Antonia (Mark Antony's daughter). He fought against the Dalmatians and Pannonians (A.D. 7-10), early holding consular rank. G. was a favourite with Augustus, who gave him command of eight legions on the Rhine (A.D. 14), and gained his adoption by his uncle, Tiberius. On the death of Augustus the legions tried to make G. emperor, but he was loyal to Tiberius, and with difficulty checked their ardour. Undertaking dangerous campaigns in Germany he defeated Arminius and recaptured the eagles taken from Varus (A.D. 9). Tiberius, jealous of his success, recalled him (A.D. 17) to Rome, where he enjoyed a triumph. He was then sent out to the E., where his moderate measures won him gratitude from all. He

d. at Antioch, probably poisoned by C. Piso, a favourite of Tiberius. Caligula and the younger Agrippina were his children. See Tacitus, *Annals*, vol. II.; Lagoriof, *Vita C. Germanici*, 1698; L. de Beaufort, *Histoire de C. Germanicus*, 1741; J. Hillebrand, *Germanicus*, 1817; monographs by A. Zingerle, 1867, and A. Breitlig, 1892; and F. Knöke, *Die Kriegszeit des Germanicus in Deutschland*, 1922.

Germanium, chemical element discovered in 1886 by Winkler in argyrodite ($\text{GeS}_2 \cdot 4\text{As}_2\text{S}_3$), a mineral found at Freiberg. It also occurs to a minute extent in the mineral euxenite. In almost all its compounds it is quadrivalent, and it has marked affinities with silicon and other elements of that group. In properties it agrees very closely with Mendeleef's hypothetical eka-silicon. Atomic weight 72.5; melting-point 900° C.

German Literature, see GERMANY, Literature.

German Measles, infectious disease resembling a mild form of measles and scarlet fever, and chiefly affecting children. The symptoms are a slight fever, headache, shivering, and enlargement of the glands of the neck, accompanied by a rash appearing first on the face and spreading downwards. The rashes last from 24 to 48 hrs. Treatment consists in confinement to bed with a light and nourishing diet.

German Ocean, see North Sea.

German Silver, or Nickel Silver, alloy consisting approximately of six parts copper, three parts zinc, and one part nickel, with sometimes a trace of iron. It forms a white, tough metal, taking a good polish, and is largely used for the manuf. of spoons, forks, and other similar articles, but, as it soon tarnishes, it is usually electro-plated. G. S. has high electrical resistance, and is largely used for making resistance coils.

German South-West Africa, see AFRICA, SOUTH-WEST.

Germantown, former suburb, now a ward, in the N. of Philadelphia, Pennsylvania, U.S.A. It contains many historic houses, i.e. the Chew House, built by Benjamin Chew, who was imprisoned as a loyalist in 1777, and the Morris House, the headquarters of Gen. Howe, and the residence of President Washington when Philadelphia was the cap. of the U.S.A. In this vicinity, too, the first paper mill in America was erected in 1690, and the first Bible printed in America was published in 1743. G. was founded in 1683 by thirteen families from Germany, incorporated in 1869, and annexed to Philadelphia in 1854. A famous battle in the War of Independence took place here Oct. 4, 1777. The prin. manuf.s. are knitted goods, yarns, and textiles.

Germanus, Saint (c. 560-740), patriarch of Constantinople, being transferred from Cyzicus to this see in 715. He defended the practice of the Church against the Emperor Leo, who espoused the cause of the Iconoclasts, and received a letter of encouragement from Pope Gregory III. In 730 he was ejected from his office. His prin. works are *A Defence of the Orthodoxy of the Writings of St. Gregory of*

Nyassa; A Treatise on the First Six Ecumenical Councils; and A Collection of Sermons and Hymns.

German Volga Republic. Until 1947 one of the autonomous republics included in the R.S.F.S.R. Except for a short distance in the S.E., where it adjoined Kazak in Asiatic Russia, it was enclosed by the Lower Volga area. It was formed chiefly of portions of the old provs. of Saratov, Samara, and Astrakhan. The chief industry of the region is agriculture, which is helped by irrigation from the Volga. Wheat, barley, maize, and other cereals, and sunflower seeds are the chief crops, and there are manufs. of flour, tobacco, leather, and motor tractors. The area of the republic is 27,000 sq. km. The ter. was settled in 1760 by Ger. colonists, invited by Catherine the Great, and Gers. still comprise most of the pop. The republic was governed by a Central Executive Committee and a Council of People's Commissaries. In 1947 the republic lost its status, and was incorporated in the Saratov region of the R.S.F.S.R. Pokrovsk (pop. 40,000), on the Volga opposite Saratov, was the cap.; Urbash is the junction for railways running from Moscow to Astrakhan and Uralsk.

Germany (Deutschland), republic of central Europe, which has a total land area of about 181,000 sq. m. Of its 4569 m. of frontier, 1220 m. only are bounded by the sea. The N. boundaries are the North Sea, the Dan. peninsula, and the Baltic; the E., Poland and Russia; the S., Austria and Switzerland; and the W., France, Belgium, and the Netherlands. The area of the former Ger. Empire estab. in 1871 with accessions of ter. as a result of the Franco Ger. war was reduced by some 27,259 sq. m. by the treaty of Versailles after the First World War, and the area of the Ger. republic which came into being in 1919 was 180,976 sq. m. (1933 frontiers). The states of the republic were seventeen in number: the free state of Prussia (including Waldeck), 113,033 sq. m.; Bavaria (free state), 29,334 sq. m.; also the free states of Saxony, 3789 sq. m.; Mecklenburg-Schwerin, 3096; Oldenburg, 2450; Brunswick, 1118; Anhalt, 888; Lippe, 469; Mecklenburg-Strelitz, 1131; Schaumburg-Lippe, 131, also the Hanse States of Hamburg, 169 sq. m.; Bremen, 93; and Lübeck, 11; the people's states of Württemberg, 7532 sq. m., and of Hesse, 2970; the federated state of Thuringia, 4527 sq. m.; and the republic of Baden, 3819 sq. m. Under the Third Reich the federal states became administrative provs. with minor alterations to the boundaries, particularly of Prussia, Oldenburg, and Hamburg. Lübeck became part of Prussia, and in 1931 Mecklenburg-Strelitz and Mecklenburg-Schwerin were united to form the prov. of Mecklenburg. By annexation the ter. of the Third Reich incorporated the Saarland (738 sq. m.), Austria (12,369 sq. m.), which became the prov. of Ostmark, and the Sudetenland (10,882 sq. m.), making a total area of Greater G. In 1939 of 224,965 sq. m.

Physical characteristics. —The coast line

is interrupted only by the small isthmus of Schleswig, yet it contains hardly any good harbours. The reasons for this are (1) that on the Baltic shallow lagoons, or land-locked bays called *Häfen*, prevent good anchorage; (2) that the shore waters are not deep enough for vessels of any size; and (3) that, owing to the lack of protection N. and E., the Baltic ports are constantly choked with ice. Along the North Sea shores are numerous dykes which serve, as in Holland, to keep out the sea, where the sand-dunes are not strong enough. The surface of G. falls naturally into three divs.: the lowlands in the N., the table-land of the S., and the basin of the middle Rhine. The lowlands are part of the great European plain, and are largely occupied with sandy tracts, with here and there peaty deposits. They are well watered, and in certain dists. fertile, whilst the monotony of their level is broken by two lines of hills whose heights vary from 500 to 800 ft., and which may be said to extend roughly from the Mecklenburg to the Vistula, and from the moors of Lüneburg in Hanover to Silesia. In the S. plateau of Bavaria, the Fichtelgebirge is clearly the pivot round which the other mt. systems revolve. Thus to its N.W. there rise the Thuringian forest and the Harz Mts., and to the N.E. the Erzgebirge, the Riesengebirge, and the Sudetic Mts. S.W. radiate the Franconian and Swabian Juras and the Schwarzwald or Black forest heights. Westward stretch the Taunus Mts., whilst beyond these, and divided only by the Rhine, are the ridges of the Vosges. In the extreme S.E. of Bavaria the Tyrolese or Noric Alps follow the N. bank of the Inn, and from this range rises the Zugspitze (9700 ft.), which is the highest summit in G. Between Basle and Mannheim the Middle Rhine is splendidly sheltered by the Vosges and the Black Forest, which guard its course to left and right. Within Ger. ter. the chief trib. of the Rhine are on the right the Neckar, Main, Lahn, Sieg, Ruhr, and Lippe, and on the left the Moselle. Fortunately the water-sheds are both far from the sea (which accounts for the considerable length of many of the rvs.) and also comparatively low, so that there are no great falls in the main streams. They are therefore navigable for the greater part of their course. Steamers can reach Ratisbon on the Danube, Prague on the Elbe, Schaffhausen on the Rhine, Iatibor on the Oder, beyond Warsaw on the Vistula, and Cassel on the Elbe. The Vistula and the Oder are Baltic waterways, but more important from a commercial point of view are the Elbe, with its chief affluents the Mulde, Havel, and the Saale, and the great Ithine, which both empty into the North Sea along with the smaller Ems and the Weser, which is the only purely Ger. stream. This latter fact is worth noticing, as the sources of the Oder, Elbe, and Vistula must be traced into Austria, and sections only of the Rhine and Danube traverse G.

Climate.—Broadly speaking, the general contours are not favourable to climate;

for the level exposed flats, N. and E., offer no resistance to the passage in winter of the dry, piercing winds from Siberia and the Arctic, whilst to the S. and W. the mountainous tracts form effectual barriers against the moist anti-trades. As regards temp., the extremes increase eastward in proportion to the distance from the Atlantic. In the warmer lats. of the S., the elevation of the plateaus counteracts the natural tendency to grow hotter, so that Ratisbon lies on the same isotherm as Hamburg. In the Upper Harz the rainfall reaches 66 in., as the Harz Mts. are far enough N. to catch the rains borne by the winds sweeping across Holland, but the mean ann. precipitation is only about 20 in. On the whole the climate may briefly be described as continental. It should be noted that the general slope of the country is from the S.E. to N.W., that is, away from the sun, and also that the Rhine valley is so sheltered that it reaps the full benefit of its warm lat., and thus enjoys excellent weather conditions.

Forests.—As would be expected the boisterous winds from the sea dwarf the scanty trees in the N.W., the land being covered for the most part with moors and heaths. Trees are still plentiful in the Bohemian, Black, and Thuringian forests, and large masses of timber are floated down the Neckar and Vistula. Chief among the deciduous trees are the beech and oak, but these do not cover more than a third of the forest lands; the Scots pine (*Kiefer*), however, is ubiquitous and, together with the white birch, makes up nearly a half. In 1939 the forest area amounted to some 42,797,000 ac., of which over 31,600,000 were state controlled, 9,000,000 ac. being deciduous and the remainder pine, larch, and fir.

Flora and Fauna.—The flora and fauna are fairly extensive, including over 2000 varieties of vascular plants and as many as 16,000 species of insects. All plants peculiar to the temperate zone are cultivated with success, and in general the flora may be said to be largely such as would be expected from the union, which occurs here, of the Alpine and Baltic elements. As regards the fauna, there are hardly any species found only in G. The elk still exists in the forests of E. Prussia, and the wild boar, stag, and roe continue to occupy the remoter and more hilly dists. All larger game have been extinguished. The rvs. and seas teem with fish, the former abounding in members of the carp and salmon tribes.

Agriculture.—In 1939 the total area under cultivation was over 71,000,000 ac., divided between arable land (48,000,000 ac.), grass and pasture (21,284,000 ac.), orchards and market gardens (1,888,000 ac.), vineyards (203,000 ac.), tobacco (33,000 ac.), hops (21,000 ac.). The following year (1940) the acreages placed under crops were as follows: wheat (6,049,000 ac.), rye (12,079,000 ac.), barley (4,833,000 ac.), oats (8,205,000 ac.), potatoes (7,910,000 ac.), sugar beet (1,421,000 ac.), hay (18,780,000 ac.). The crop yields for that year (1939) in metric

tons were as follows: wheat 5,584,500, rye 9,281,000, barley 4,244,000, oats 6,827,000, potatoes 56,300,000, sugar beet 17,390,000, hay 25,017,000. Rye and oats grow in the N. despite the drawbacks of poor climate and soil. Flax, hemp, and the beet—the last for the sugar industry—grow in Saxony and in the Baltic prov., especially in Hanover. The vine covers the dry, sunny slopes of the Mosel, and is also grown along the Ithline. The rich alluvial soils of the sheltered valleys in the S W. are also favourable to the production of tobacco and hops,

agric. land) into smaller holdings with compensation to the previous owners. Germans expelled from areas under Polish rule were settled in these smaller holdings.

Minerals.—G. is rich in minerals, especially in coal and iron. The industrial activity of the country was founded on the fact that these two minerals are found together, and moreover in proximity to navigable water-courses. In the Rhine basin the coal beds follow the courses of the Ruhr, Saar, and Ill, and excellent iron ore is found in both the Ruhr and Saar coalfields. The Saxon



BERNKASTEL AND THE MOSEL (MOSELLE)

which were cultivated with success in Baden, Hesse, and Bavaria. The co-operative system was a marked feature of Ger. agriculture, and the societies numbered nearly 40,000 with a membership of over 4,000,000. In normal times over 13,000,000 were employed in agriculture in G. Small estates and peasant holdings were to be found mostly in the W. and S. Ger. states while the large estates were in the N.E. As a result of measures of land reform in Brandenburg, Mecklenburg, Saxony, Thuringia, and W. Pomerania during the Russian occupation the large estates, representing about 40 per cent of agric. land, were broken up in 1945 and divided among landless peasants, farm workers, and peasants resettled from central and E. Europe. A similar law in the U.S. occupied zone provided for the div. of large estates (some 5 per cent of the total

mines in the Elbe basin yield lignite coal. Almost one half of the zinc produced in the world was at one time mined in G., the chief centre being at Aachen in the Rhineland and Königshütte (Krolewská-Huta, now in Poland), whilst the silver, lead, and copper mines in the Harz Mts. and in Saxony are in normal times highly productive. Most of the Ger. copper came from the Harz and Erzgebirge Mts., whilst large quantities of rock and potassium salts were produced in Hanover, Saxony, Thuringia, and Anhalt. The mineral springs of Baden-Baden, Wiesbaden, Ems, etc., are world famous. After the collapse of G. in 1945 the Ruhr coal-mines were taken over by the Brit. and the Saar coal-mines by the Fr., while the Silesian coalfields and other mines were incorporated in ter. allocated provisionally to Poland (see *PORDHAM AGREEMENT*). The total production of

coal, including lignite, in the first year after the Second World War was 15,000,000 tons, comprising in the Brit., U.S., and Fr. zones of occupation 4,000,000 tons of steam coal and 3,000,000 tons of lignite (34 per cent and 64 per cent of pre-war output respectively), and in the Russian zone 168,000 tons of steam coal and 7,900,000 tons of lignite (58 per cent and 71 per cent of pre-war output respectively).

Manufactures.—The industrial development of G. proceeded at an almost unprecedented rate throughout the last century. The following catalogue will give some idea of the local distribution of the various industries. Iron goods and machinery are manufactured in the former provs. of Prussia, Saxony, and Bavaria; steel goods in the Ruhr and Rhineland. The electrical industry is centred principally in Berlin. Woollens and worsted are produced in Saxony and the Rhine prov.; cotton goods in Prussia, Saxony, Baden, and Bavaria; silk at Elberfeld (Rhenish Prussia) and in Baden; and linen goods in Westphalia, Silesia, and Saxony. The Rhine and Moselle dists. are important centres for light wines; Bavaria is famous for its toys, Nuremberg for its watches and pencils, and Meissen, Dresden, and Berlin for their porcelain. Finally there are manufacturers up and down the country of chemicals, beer, sugar, tobacco, leather (in Hesse-Darmstadt), and paper. The whole of Ger. industry suffered severely as a result of the Second World War. In the textile industry alone it was estimated in the Brit., U.S., and Fr. occupation zones that 30 per cent of the looms were destroyed in the cotton, rayon, and silk industries and 70 per cent in the woollen. Under the conditions imposed by the Allies Ger. industry was limited to civilian consumer goods, and the output of steel to under 10,000,000 tons.

Commerce.—The growth in the commercial prosperity of G. during the nineteenth century was extraordinarily rapid, but the First World War, with the subsequent treaty of Versailles, did much to check the expansion. The previous development was, in great measure, due to the Zollverein, or Ger. Customs Union, which since 1879 incorporated G. among protectionist countries. In 1938 imports were valued at 5,449,000,000 marks and exports at 5,256,000,000 marks. Grain and flour, textile goods, raw minerals, chemicals, hides, and leather comprise the chief goods imported, whilst sugar, all forms of textile manufactured articles, leather goods, iron and iron wares, including machinery, coal, paper, and glass are the staple exports. In both the above lists the various groups of merchandise are tabulated, broadly speaking, in order of value, but the war economy of the years preceding the outbreak of war in 1939 entirely upset this order. In normal times a large proportion of Ger. merchandise passed out through Rotterdam and Antwerp, the overland commerce being at least as extensive as its maritime. Trade with the United Kingdom in 1938 was valued at £30,150,000 (imports from

G. into United Kingdom) and £20,551,000 (exports of Brit. produce into G.). In the year before the Second World War trade was at its largest with the following countries (figures in brackets for 1938 in millions of marks): United Kingdom (imports 309, exports 374); Netherlands (imports 208, exports 460); Italy (imports 284, exports 349); U.S.A. (imports 454, exports 157); Sweden (imports 267, exports 275); Argentine (imports 240, exports 153); France (imports 150, exports 229); Brazil (imports 220, exports 163).

Shipping.—Before the Second World War the Ger. mercantile marine stood third among the merchant navies of the world in respect of tonnage and fourth in respect of the number of ships. In 1939 the Ger. merchant navy numbered some 2300 ships of over 4,000,000 gross tonnage. Of this number only about 400 were sailing vessels. Over 15,000 foreign ships with cargo entered and cleared Ger. ports annually, with tonnage of over 15,000,000. Ger. merchant shipping in May 1918 showed a total of 227,785 registered tons.

Colonies.—G. pursued a vigorous colonial policy from the time of Bismarck, but by the treaty of Versailles (1919) the Ger. colonial empire was entirely destroyed. During the First World War all Ger. colonies fell into the hands of England, France, and Japan, while secret treaties existed to perpetrate the occupation in the event of an allied victory. By the treaty of Versailles the former Ger. colonies were partitioned as follows: The Kamerun was divided into the New Cameroons (107,000 sq. m.; native pop., 2,800,000), which was incorporated into Fr. Equatorial Africa, and the Old Cameroons, which were placed, in part, under a Fr. mandate (166,489 sq. m.; pop. 3,000,000) and in part under a Brit. mandate (31,000 sq. m.; pop. 555,000). As 'B' mandates of a similar class, 22,000 sq. m. of Togoland (pop. 717,000) went to France and the remaining 12,600 sq. m. (pop. 185,000) to Great Britain. Former Ger. E. Africa was renamed Tunganyika Ter. and became a Brit. possession; Ger. S.W. Africa was awarded to the Brit. Union of S. Africa; New Guinea (Ger. Kaiser Wilhelm Land, Bismarck Archipelago, and Ger. Solomon Is.) to Australia; Ger. Samoa to New Zealand; Nauru Is. to Great Britain; and the Caroline, Marshall, Marianne, and Pefow Is. to Japan, which country received also Kiao-Chau.

Allied Zones of Occupation.—Following G.'s unconditional surrender (June 5, 1945), the powers of government were taken over by the govs. of Great Britain, the U.S.A., Soviet Russia, and France, and were exercised through the Allied Control Council. It was decided by the Potsdam Agreement (q.v.) that for the time being no central Ger. Gov. would be estab. The administration of G. thus became the responsibility of the Control Council, but, subject to the council's overriding authority, state and prov. govs. have been set up within the four

zones of occupation. Local self-government is also estab.

In 1946 the state of Prussia, as it had existed in the Third Reich, ceased to exist and the whole country was redivided into states or *Länder* for administrative purposes. Thus the Brit. zone consists of four *Länder*: Lower Saxony with Hanover as cap., and comprising the former Prussian prov. of Hanover and the former *Länder* of Brunswick, Oldenburg, and Schaumburg-Lippe; N. Rhine-Westphalia with Düsseldorf as cap., and comprising the former Prussian prov. of Westphalia, the former Land Lippe, and the governmental dists. (Regierungsbezirke) of Köln (Cologne), Aachen, and Düsseldorf; Hamburg, comprising the former Land Hamburg; and Schleswig-Holstein with Kiel as cap., and comprising the former Prussian prov. of Schleswig-Holstein. Powers previously exercised by the Brit. regional commissioner in each Land have been transferred to the Land govs., which have executive and legislative powers and are empowered to draw up the prov. constitutions. Hamburg and Bremen in the U.S. zone have regained Hanseatic status which they lost under the Third Reich.

The U.S. zone also contains four *Länder*: Bavaria with Munich as cap., and, except for the Palatinate on the l. b. of the Rhine and the tn. and rural dist. of Lindau, corresponding to the former Land Bavaria; Württemberg-Baden with Stuttgart as cap., and corresponding to the U.S. occupation zone of the former *Länder* of Württemberg and Baden; Hessen with Wiesbaden as cap., and comprising the ter. of the former Land Hessen on the r. b. of the Rhine and the former Prussian prov. of Hessen-Nassau, with the exception of the four rural dists. St. Goarshausen, Unterlahnkreis, Unterwesterwald, and Oberwesterwald; and Bremen, corresponding with the former Land Bremen. Each of these states has a Land gov. under a Ger. Prime Minister, whose Cabinet has to be approved by the Amer. authorities. The Land govs. have executive and legislative powers, and a uniform policy throughout the zone is ensured by regular meetings of the three Prime Ministers, forming a *Länderrat*.

The Fr. zone is governed by a commissioner-general, who is responsible for co-ordinating all administrative services in the zone. It consists of the following four *Länder*: Rhineland-Palatinate with Koblenz as cap., and including the Palatinate, the former Land Hessen on the l. b. of the Rhine, the Regierungsbezirke Koblenz and Trier of the former Prussian Rhine prov., and the four rural dists. of former Hessen-Nassau which were not included in the Land Hessen in the U.S. zone; Baden with Freiburg as cap., and including the Fr.-occupied part of the former Land Baden; Württemberg-Hohenzollern with Tübingen as cap. It includes the former Prussian dist. of Hohenzollern and the Fr.-occupied part of the former Land Württemberg; and the Saar dist. with Saarbrücken as cap., comprising the Saar ter. as defined by the

treaty of Versailles enlarged (Oct. 1946) by a number of adjacent rural dists. of the former Prussian Rhine prov. A prov. gov. was set up with the task of framing a constitution. Zonal administration as a whole continues to be the responsibility of the Fr. military gov.

The Russian zone is administered by a central body, consisting of various depts. with Ger. nationals at the head of each under the chairmanship of the Russian commander-in-chief. The Soviet zone includes the following *Länder*: Brandenburg, with Potsdam as cap., consisting of the former prov. of Brandenburg on the l. b. of the Oder and the W. Neisse; Saxony, with Dresden as cap., includes the former Land Saxony and the part of the former prov. of Silesia on the l. b. of the W. Neisse; Saxony-Anhalt, with Halle as cap., comprising the former Land Anhalt and the former Prussian prov. of Saxony with the exception of the Regierungsbezirke of Erfurt, Thuringia, with Weimar as cap., including the above-mentioned dist. of Erfurt and the former Land Thuringia; Mecklenburg with Schwerin as cap., comprising the former Land Mecklenburg and the part of the former prov. of Pomerania on the l. b. of the R. Oder. Prov. Govs. operate in the provs. of Brandenburg and Saxony-Anhalt, while Saxony, Mecklenburg, and Thuringia are governed by separate Ger. Govs., each with a Prime Minister as in the U.S. zone, which possess executive, legislative, and judicial authority, subject to the requirements of the Control Council and the Soviet military gov.

In 1946 and 1947 local elections and elections on advisory or constituent assemblies or state parliaments took place in all four zones.

Population The pop. of the Ger. Reich (census 1939) was 69,622,483, an increase of 3,451,000 or 5·2 per cent since the 1933 census. In 1939 the pop. was divided among the various states as follows: Prussia 41,762,404; Saxony 8,280,090; Saxony 5,206,861; Württemberg 2,907,166; Baden 2,518,103; Thuringia 1,760,335; Hamburg 1,682,220; Hesse 1,469,909; Mecklenburg 910,826; Saarland 863,735; Brunswick 599,203; Oldenburg 582,100; Anhalt 436,213; Bremen 400,086; Lippe 188,598; Schaumburg-Lippe 54,162. The pop. of Austria (Ostmark) in 1939 was 7,009,014 and of the Sudetenland 2,945,261, so that the pop. of Greater Germany in that year (excluding the remainder of Czechoslovakia) was 79,576,758. After the Second World War the area of G. was approximately one-fifth smaller than in 1933 and according to a census taken in 1946 the pop. was 65,910,999. The pop. of the various zones of occupation was as follows: Brit. zone 22,794,655; Russian zone 17,313,521; Amer. zone 16,682,573; Fr. zone 5,939,807; Berlin 3,180,383.

The pop. figures include some three to four million Gers. repatriated from Poland and Czechoslovakia. These increases helped to offset the heavy losses during the war estimated at 7,500,000, and it is estimated that by the time all Ger.

prisoners of war have been repatriated, the pop. will have been increased to over 70,000,000. In April 1949 small frontier areas in the W. were ceded to Holland, Belgium, and Luxembourg. Holland received the Zelkant near Maastricht, with a pop. of 10,000; Belgium, 20 sq. m., with a pop. of 500 (near Aachen and Rotgen); and Luxembourg, the forest of Kammerveld.

Chief Towns.—In 1939 two tns. had a pop. of over 1,000,000, twenty-one others over 250,000, and thirty-two over 100,000. The pop. of the largest tns. (census 1939) was Berlin 4,332,242; Hamburg 1,682,220; Munich 828,325; Cologne 768,426; Leipzig 701,606; Essen 659,871; Dresden 625,174; Frankfurt-on-Main 546,649; Dusseldorf 539,905; Dortmund 537,000; Hanover 472,527; Stuttgart 459,538; Duisburg-Hamborn 431,256; Nuremberg 430,851; Wuppertal 398,099; Bremen 342,113; Chemnitz 334,563; Magdeburg 334,358; Gelsenkirchen 313,003; Bochum 303,288; Mannheim 283,801; Kiel 272,311; Stettin 268,915; Halle-on-Salle 220,364; Cassel 217,085; Brunswick 201,306; Oberhausen 191,305; Karlsruhe 189,950; Augsburg 185,704; Wiesbaden 172,039; Krefeld-Uerdingen 169,485; Erfurt 166,661; Aachen 165,710; Mainz 158,971; Ludwigshafen 153,630; Haagen 151,870; Münster 143,748; Ludwigshafen 143,417; Solingen 138,587; Mülheim 136,805; Potsdam 136,165; Saarbrücken 135,080; Bielefeld 128,714; München-Gladbach 127,115; Hindenburg 126,402; Rostock 122,399; Dessau 120,732; Harburg-Wilhelmsburg 118,193; Gleiwitz 117,066; Darmstadt 115,526; Freiburg 111,560; Plauen 110,342; Würzburg 108,617; Remscheid 103,437; and Bonn 101,391.

The pop. according to the pop. census of Oct. 29, 1946, was in Berlin 3,187,500, Hamburg 1,427,000.

Internal Communications.—In 1924 the Ger. railways, which since 1920 had been operated through the central gov., were put under the management of a private company—the Ger. Railways Company—but they remained state property. In 1937 the operation of the railways was again taken over by the State. The total length of line at that time was 42,300 m. Road construction was considerably advanced under the Third Reich. Over 1300 m. of motor roads were opened between 1933 and 1939, making a total of over 132,000 m. of road, including 25,600 m. of motor road and 52,200 m. of first-class country road, approximately 2000 m. of the new roads being the well-known *Autobahnen*. Additional to these communications, G. possesses an elaborate network of canals. By far the most important of these is the Kaiser-Wilhelm Canal (61 m. long), which unites the North Sea and the Baltic. The Midland canal, opened in 1938 (90 m. long), joins Berlin with the Oder, Elbe, Weser, and Rhine. Other important canals are the Dortmund-Ems (150 m. long) and the Elbe-Elster (43 m. long) in a system of 5000 m. of artificial waterway, including 1500 m. of ship canal, linked with some 6000 m. of navigable rvs. In the field of civil

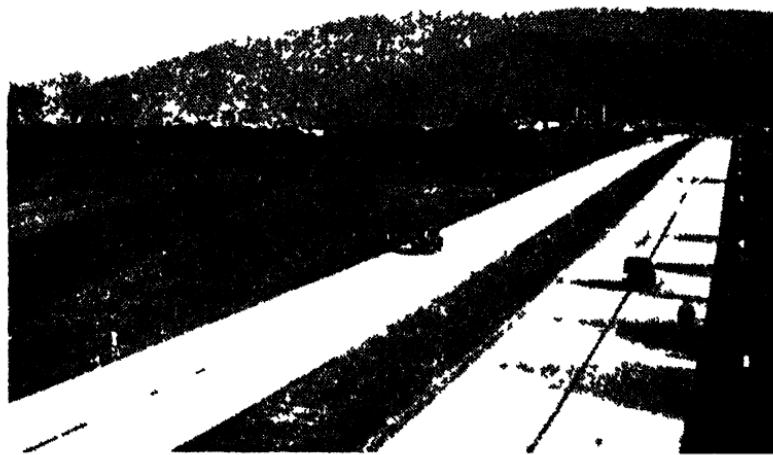
aviation, G. reached a high standard of development. In the years preceding the Second World War Ger. air lines were carrying over 200,000 passengers annually, with some 400 tons of luggage, 1000 tons of goods traffic, and 5000 tons of mail. In 1874 the postal and the telegraphic dep'ts. were amalgamated and since that date have made remarkable strides forward. They were controlled by the State, and in 1938 the post, telegraph, telephone, and radio offices numbered 64,766, employing some 398,000 persons. Telephone and telegraph lines extended over a distance of 236,000 m. After the conclusion of the Second World War, postal communications were in April 1946 resumed between G. and all other countries, excluding Spain and Japan.

Constitution and Administration.—The Republican constitution adopted at Weimar in 1919 formed G. into a federation of individualist states. The Bundesrat or Federal Council under the Ger. Empire was replaced by the Reichsrat, which was equally federal, each state being represented by members of its own gov. A state had at least one representative, while the larger states sent one delegate for every 700,000 inhab. The Reichsrat was not superior to the Reichstag or National Assembly to the same degree as was the former Bundesrat. Election to the Reichstag was by universal suffrage and proportional representation. The Reichsrat became a consultative rather than a legislative chamber. The gov. had to ask its consent before introducing a Bill, and if this was refused the gov. explained to the Reichstag the difference of opinion. If the two Chambers could not agree the president might call a referendum. The president of the Reich was elected by an absolute majority in the National Assembly for a period of seven years and could be re-elected. He had command of the army, but his powers were limited in that all orders required the counter signature of the federal chancellor. The president might summon any one he chose to form a ministry, but the chancellor depended on the support of the Reichstag. After the revolution some of the old political parties changed their names. The Conservatives (Junker party) became the National People's party (Nationalists), and their policy was to extend the powers of the president and to limit those of the Reichstag. The National Liberals became the People's party, representing industry and commerce, and their policy was one of capitalistic enterprise. The Centre party retained its position, relying on the support of the Catholics. The individualist Radicals reorganized themselves as the Democratic party and were bourgeois and republican in sympathy. The remaining parties were the Majority Socialists and the Independent Socialists.

With the rise to power of the Nazi party the Weimar Constitution was virtually, although not *de jure*, set aside, and the Reichstag elected in 1933 vested absolute power in Hitler and his Cabinet. The Enabling Act of that year gave Hitler

power to legislate by ordinance. Under this act he set up a personal dictatorship with himself as chancellor, in which all the activities of the country—political, economic, industrial, commercial, and cultural—were *gleichgeschaltet* (totalitarianised). Freedom of speech and even of thought and of the press was abolished, equality before the law was limited by racial laws, and personal freedom from arrest was curtailed. No political parties were tolerated save the National Socialist (Nazi) party. There continued to be only one legislative assembly, the Reichstag, elected according to the provisions of the Weimar Constitution by universal, equal direct and secret votes.

Code of civil procedure was effected to bring it into harmony with the civil code, and these codes came into force in 1900. A further revision of the code of civil procedure took place in 1924. The code of criminal law was revised in 1876. The arrangement of the civil code was based on Roman law, which in a modernised form was the 'common law' of Germany before the introduction of the civil code. The code is divided into five books; the first is general, the second, third, fourth, and fifth books treat of the 'law of obligations,' the 'law of things,' 'family law,' and the 'law of inheritance.' The commercial code contains three divisions, the first deals with mercantile trade generally, the



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of male and female voters. It came to be composed exclusively of the supporters of Hitler and was relegated to an ornamental function. In matters of supreme importance to the nation a referendum was provided for. The independence of the federal states was curtailed under the Third Reich. By the Unification Act of April 7, 1933, they were brought under the rule of *Reichsstatthalter* or governors directly responsible to Hitler. The following year the sovereign rights formerly possessed by the states passed into the hands of the Reich Govt. The *Landesstatthalter* passed under the jurisdiction of the minister of the interior and the Reich Cabinet arrogated to itself the promulgation of new constitutional laws for the whole of Germany. The federal states thus became merely administrative units.

Law and Justice—German civil law, a model of codification, was first drawn up in 1887, and after revision became law in 1896. At the time an entire transformation of the commercial code and the

second with mercantile partnerships and the third with mercantile transactions. There is no actual guide to the interpretation of German law, but precedent, although theoretically not binding, carries great authority in practice.

There were four kinds of courts—the ordinary, the special, the administrative, and the *Staatsgerichtshof*, which last was a court for settling constitutional questions. With the exception of this state court and the supreme court (*Reichsgericht*) the establishment of courts was the business of the individual states, and the new constitution of 1918 did not interfere with this. The *Kaufsgericht*, situated at Leipzig, was composed of five criminal and seven civil senators consisting of five judges each. The court exercised a revisory jurisdiction over all inferior courts. Directly under this supreme court were twenty-nine courts which had original jurisdiction in serious offences, and which contained criminal and civil senates consisting of three to five judges. These were the

Oberlandesgerichte, and they exercised appellate jurisdiction over the *Landgerichte* in civil cases and a revisionary jurisdiction in criminal cases. There were 173 *Landgerichte* and they had a fairly extensive jurisdiction in civil and criminal cases and in divorce proceedings. There were five judges in the criminal chamber of a *Landgericht*, four votes being required to make a conviction valid. Three judges from such a court presided at intervals over jury courts (*Schwurgerichte*), and juries did not therefore form a permanent part of the system. Not the least important work of the *Landgerichte* was to revise the decisions of the *Amtsgerichte* or people's courts, of which there were (1939) nearly 2000. They were the lowest courts of the first instance, being controlled by single judges, who were competent to hear only petty civil and criminal cases. Among the special courts were the courts of arbitration and labour courts. These latter, instituted in 1927, had a specified jurisdiction, especially over cases between employers and employees. Under the Third Reich the *Reichsgerichte* and the *Antsgerichte* became organs of the central gov. A law promulgated in 1935 estab. the novel principle in criminal law that the courts punish offences under the criminal code if they were considered deserving of punishment, 'according to the underlying idea of a penal code or according to healthy public sentiment.' By a later decree (Aug. 24, 1942) statutory justice was abolished, and Hitler became the supreme arbiter of law, administering justice arbitrarily through the minister of justice and the president of the Secret People's Court. After the fall of the Hitler regime the Allied Control Council announced on Oct. 22, 1945, the estab. of a reformed judicial system whereby all persons are equal before the law and cannot be deprived of their legal rights whatever their race, nationality, or creed. No person may be deprived of life, liberty, or property without the process of law.

Defence.—By the law of Dec. 30, 1920, the Ger. Army was constituted at the strength allowed by the terms of the treaty of Versailles, the limit being 100,000 men, of which no more than 4000 were to be officers, the men serving for twelve and the officers for twenty-five years. Only a certain number of discharges were allowed each year to avoid the formation of a reserve force of men who had undergone military training. The former Ger. general staff was proscribed, but in spite of this Gen. von Seeckt was given the rank of commander-in-chief of the Reichswehr. The federal armies were abolished, but a decentralised body of police (*Schutzpolizei*) was formed, trained on military lines. By the Boulogne note of June 22, 1920, the number of police permitted to G. was fixed at 150,000, of which 85,000 were allotted to Prussia. By the same terms the police were allowed one rifle to every three men, a machine pistol to every twenty men, and one armoured car to every thousand men. In addition to the

police there was an armed citizen guard called the *Einwohnerwehr*. This force was disbanded owing to allied pressure after the Kapp putsch in Aug. 1920, but the Bavarian *Einwohnerwehr* remained. Conscription for the Ger. Army was abolished. Under the Nazi regime, however, the obligations of the treaty of Versailles in respect of armaments were repudiated (March 16, 1935), and conscription was reintroduced. The army was accordingly expanded, and by 1938 it was made known publicly that the army comprised 39 infantry divs., 4 light divs., 5 armoured divs., 3 mt. divs., and a cavalry brigade. An infantry div. was reckoned to number approximately 15,000 men, and the total armed forces were estimated at nearly 900,000 men, excluding reserves. On mobilisation on the outbreak of the Second World War a conservative estimate was double this number of men. By 1944 it was estimated that there were over 300 divs., including 30 armoured divs., and in Oct. of that year the *Volksturm* was also brought into existence on the lines of the Brit. Home Guard. Following G.'s unconditional surrender on June 5, 1945, the work of demobilising and disarming the Ger. army was put in hand by the Allied Control Commission, and was largely completed by the end of 1946.

The treaty of Versailles restricted the Ger. Navy to 6 battleships, 6 cruisers, 12 destroyers, and 12 torpedo boats, while submarines were prohibited. These restrictions were disregarded and were virtually replaced by the Anglo-Ger. Naval Agreement (1935), which allowed G. a maximum tonnage equal to 35 per cent of the Brit. tonnage for each class of vessel with the exception of submarines in which parity was permissible with, however, a corresponding reduction in other classes. G. entered the Second World War with three so-called 'pocket battleships,' the *Deutschland* (later renamed the *Lützow*), *Admiral Graf Spee*, and *Admiral Scheer*, each of 10,000 tons, heavily armed and with a cruising range of 10,000 m. In addition the *Gneisenau* and the *Scharnhorst*, battleships of 26,000 tons, were completed in 1938. Three battleships of 35,000 tons were also under construction. There were 6 light cruisers and 2 of 10,000 tons—the *Admiral Hipper* and the *Prinz Eugen*. Destroyers and torpedo boats numbered about 40. At least 50 submarines were in commission, built since 1935 when building was resumed. At the end of the war the surviving ships of the Ger. fleet were distributed between Great Britain, France, U.S.A., and U.S.S.R. The *Prinz Eugen* and the *Nürnberg*, which were the only two surviving capital ships, were allotted to the U.S.A. and the U.S.S.R. respectively.

G. under the Nazi regime built a formidable air force in defiance of the provisions of the treaty of Versailles. Its size was not revealed, but it was estimated at the outbreak of the Second World War that there were over 3000 first-line aircraft. The *Luftwaffe* consisted of 420 squadrons, each with 12 aircraft, including

reserves. At the conclusion of the war the air force was abolished.

Finance.—The greatest factors in Ger. public finance since the First World War were the enlarged scope of governmental activities and the operations of the terms of the treaty of Versailles. Under the new constitution the tax system and administrative charges became centralised. The right of direct taxation belonged to the federal gov., and as compensation the various states received a share in the revenues. The payments to the states represented a proportion of the federal taxes, especially the income and turnover taxes. Prior to the Nazi régime it was customary for the Ger. Gov. to publish the text of the ann. budget law, together with an explanatory memorandum. But after 1933 no budget was pub. It is therefore impossible to ascertain the expenditure of the gov., but returns of certain revenues are issued officially. Between 1933 and 1938 the revenue from taxation and customs rose from 6850 million marks to nearly 14,000 million marks. Of the total of 14,000 million marks (for 1937-38) taxes on property and business accounted for 9820 millions, excise 2550 millions, and customs 1630 millions. At the end of 1938 the total debt of the Ger. Reich amounted to 23,821 million Rm. Of this total long and medium dated internal loans accounted for 11,305 million Rm. and short dated internal loans for 4 753 millions, pre-First World War debt for 2,807 millions, and external loans for 1285 millions. To these figures must be added the *Sonderwechsel* (special bills) for financing the special needs of the State, which do not necessarily carry any claim for repayment. At the close of 1937 12,600 milliards of marks-worth of these bills were in circulation. In addition there were 60.7 million Rm. of irredeemable loans and 117 million Rm. of tax certificates, which after a certain lapse of time were accepted in payment of taxes. The national income, which in 1913 was officially given as 45,693 million Rm. and about the same in 1933 (it had fallen from 76,000 millions in 1929), was shown as nearly 71,000 million Rm. in 1937.

Education.—It stood high in the field of state education, and was conspicuous for admirable systemisation and for the variety and thoroughness of the technical training provided. It was estab by law that every child from the age of six to fourteen must attend some recognised school. By the law of April 28, 1920, Ger. children were bound to receive a four years' course of instruction in the 'foundation school' or *Grundschule*. The next highest school for elementary education was the 'people's school' (*Volksschule*). Besides these, there was the 'middle school' (*Mittlere Schule*), where instruction was given *inter alia* in Eng. and Fr. The Republican constitution abolished all private preparatory schools, making the public elementary school common to all. To prepare for the univs. and for admission to certain professions, there were secondary schools with a course of study extending over eight years

(*Gymnasium*). Two other kinds of schools were estab. experimentally—the high school (*Deutsche Oberschule*) and the *Aufbauschule*, the former specialising in Ger. subjects and modern languages, the latter providing an intensive and curtailed high school education for the more promising pupils of the elementary schools. The univs. were the centres of intellectual life. All of these have the four faculties of theology, law, medicine, and philosophy, and many are some of the oldest foundations of their kind in Europe. Outside the country the best known are probably Berlin, Munich, Leipzig, and Bonn, which also have the largest numbers of undergraduates, and Göttingen, Heidelberg, Rostock, Greifswald, Freiburg, Tübingen, and Jena. Four teach theology according to the Rom. Catholic doctrine, whilst in four others the theological faculty is open to both Protestants and Rom. Catholics; the remaining univs. are Protestant. The Catholic faculty in Munich was closed in 1939. Three new univs. have been founded at Hamburg, Frankfort, and Cologne. In addition to the univs. there are the *Technische Hochschulen*, which were state institutions of univ. rank, where such special subjects as architecture, engineering, chem., mining, forestry, shipbuilding, etc., could be studied, although arrangements were also made for a more liberal education. Below these there were the *Handels Hochschulen*, which were set up in most of the big cities to facilitate adult education. The high standard of Ger. education throughout the grades was maintained under the republic, while the compulsory religious instruction, common to all schools during the empire, was replaced by optional classes in religion at the discretion of parents. On his accession to power Hitler promised absolute equality in education to all Gers. This promise was not kept. As a result Ger. secondary education steadily declined under the Third Reich. Less than 20 per cent of the Ger. people had completely free education. In 1928 823,000 children were receiving secondary education, in 1938 only 661,000. One of the first tasks of the Allied Control Council after the occupation of G. was to 'denazify' the schools. In the Third Reich the whole of education had been geared to the Nazi doctrine, and text-books and teaching falsified to that end wherever necessary. Teaching staff had therefore to be renewed and proper text-books provided. By Oct. 1, 1945, schools were reopened in all four zones of occupation. In the Brit. zone on that date full-time elementary education was provided for a million children, and part-time facilities for a further million. In the U.S. zone 1,500,000 children were put to school, representing 90 per cent of the total. Similar steps were taken to restart education in the Fr. and Russian zones. Univ. life which suffered severely under Hitler and still more severely as a result of the war began again. In the autumn of 1945 the univs. of Bonn, Göttingen, Hamburg, and Kiel opened in the Brit.

zone, and Heidelberg and Marburg in the Amer. In the Fr. zone Tübingen and Freiburg Univs. reopened, while the univ. of Mainz, a fifteenth-century foundation, dissolved in 1815, was re-estab. (May 22, 1946). In the Soviet zone teaching began again at Greifswald and Rostock in Nov. 1945, while on Jan. 29, 1946, Berlin Univ. reopened under Russian auspices with 3000 students. In the spring of 1948 Gen. Robertson, commander-in-chief of the Brit. zone of occupation, appointed a commission to consider the Ger. univs. in that zone and, in particular, 'to report to the military governor on the extent to which they are making their full contribution to the democratic development of the German nation and to recommend any measures which may appear necessary to increase this contribution.' Ger. univs. are justly famous, but their fame is due to qualities that are not ordinarily ascribed to G., to their freedom and to the individuality in research that they encourage. Their essential shape was given them by von Humboldt in the early years of last century. He created what the Gers. call the idea of a univ. as the home of free research, and through all the hundred years or more since the von Humboldt pattern began to show itself in Ger. univs. they have remained is. of freedom in an authoritarian country. The commission's report was to be concerned directly only with the univs. and technical 'high schools'; it was not to be concerned with the present plight of Ger. univs., their ruined buildings, destroyed libraries, lost endowments, and the poverty of their students, but only with the shape which the commission hoped they might assume in the future. The commission was a Ger. body, with two attached non-Gers. As beffited a Ger. commission, their report begins by stating in general terms the function of a univ.: 'to serve mankind by the teaching of that truth which comes from scientific research into reality.' The main proposals are: (i) univ. education is to be made possible for all classes of the pop. (the proportion of working-class students in Ger. univs. is much lower than it is in Englund.); (ii) a new institution called a univ. council for each univ. is to help to make closer the relation between the univ. and all sections of the pop.; (iii) there is to be a wider conception of the function of the teaching staff, in which the teacher is to take his place alongside of the research worker; and (iv) the Ger. univs. are to aim at the education, in the full sense of the word, of their students, teaching them the unity of culture through what the Gers. call a *Studiumgenerale*, a general education which is to be given to all students alongside of their specialt. training. The proposal for a univ. council is a characteristically Ger. adaptation of the constitution of Scottish and modern Eng. univs. The proposals for a *Studiumgenerale* are of interest to Eng. educationists, for they imply the existence of a departmentalism and over-specialisation which are just as rife in England and America as they are in Germany. Some

plans to combat these evils are already being tried in G., in Heidelberg and in Göttingen, for example, and also in the great Ger. technical univs.

Religion.—The disestablishment of the Church under the new republic helped further the decline of church influence during the First World War, but the Catholic religion, being outside state control, was less affected, and retained its influence, especially in Bavaria and S. G., although a Catholic minority existed in Prussia. Ger. Protestantism was the result of the fusion between Lutherans and members of the Reformed Church, and after the disestablishment the Protestants banded themselves together in the 'Ger. Evangelical Church League.' In 1931 an attempt was made to unite the Evangelical churches into the Ger. Evangelical Church under the direction of a Reich bishop, 'called' by the National Synod at the nomination of the heads of the regional churches. The attempt completely failed, and the State authority found itself in conflict with the Evangelical regional churches. In Sept. 1933 a law was promulgated for the security of the Ger. Evangelical Church, giving absolute powers in eccles. matters to the minister for eccles. affairs. Throughout 1937 and 1938 the State authorities were in conflict with both the Protestant and Catholic Church organisations, the State striving to establish a Ger. National Church closely associated with the neo-heathenism of the doctrines of Alfred Rosenberg. There are five Rom. Catholic archdioceses, seventeen suffragan bishoprics, and one bishopric immediately subject to Rome. The 'Old Catholics' have a bishop at Bonn. In 1939 further state control of the Ger. Evangelical Church was decreed by the minister for eccles. affairs, particularly by the order that pastors might be removed from office 'for official reasons' and by the application of the Nazi conception of leadership in church administration. (In the same year both Rom. Catholic and Protestant Churches in Austria were disestablished by the Nazi Gov. of G.) After the war the Nazi-influenced constitution of the Ger. Evangelical Church was abrogated and a council of the Evangelical Church in G. was elected. The Evangelical Church was admitted to the World Council of Churches in Feb. 1946. Pre-war statistics of religious confessions gave: Protestants, 10,865,000; Rom. Catholics, 21,172,000; Jews, 199,700; and others, 2,646,800. To-day in Bavaria, Lower Saxony, Württemberg-Baden, Schleswig-Holstein, and Hamburg there are approximately 12,367,000 Protestants and 8,916,000 Rom. Catholics.

History.—As far back as 213 B.C. there is mention of certain Germanic tribes, the Umbri and Teutones, who had to be driven back across the Rom. border. In the course of his Gallic conquests, Caesar came up against the valiant Ger. chieftain, Ariovitus, and banished him and his followers across the Gallic frontiers and beyond the Rhine. In 55 B.C. Caesar beat back the Suevi and Marcomanni from their settlements in modern Belgium.

An attempt in the reign of Augustus to Romanise the Germanic peoples led to a patriotic rising under Arminius, the champion of the Cherusci. From the third century onward the N. confines of the empire were continually threatened by the Saxons, Frisians, Thuringians, Goths, Alemanni, and Franks, tribes which now entered great confederacies against their common enemy, Rome, and which were obliged to trespass on Rom. ter. by the invasions into their own ter. of the savage hordes of N. folk, referred to usually as Huns and Magyars. Henceforward till the treaty of Verdun (843) (i.) was occupied by chieftains perpetually at war with one another, except when invasions from without forced them into transitory alliance. Charles the Great, the Frankish king, was crowned emperor of Rome by the pope in 800, and after his death his empire was partitioned. His grandson, Lewis, received the lands between the Rhine and Elbe, known as the 'Teutonic Kingdom of Francia,' or as the 'Kingdom of the E. Franks.' This infant G. consisted not of a single people, but of a number of fairly homogeneous tribes, the Saxons, Swabians, Bavarians, Thuringians, and Franks.

Descendants of the Carolingian Lewis ruled over (i.) till 911, when the line became extinct, and a mass meeting of the Diet, or National Assembly, arrogated to itself the privilege of choosing a King, so that from this time forward G. became virtually, at least, an elective in place of an hereditary monarchy. Their first choice was Conrad of Franconia. His successor, Henry of Saxony, popularly called Henry the Fowler, founded the Saxon dynasty which lasted till 1024, and was remarkable for the energy of its rulers. In 962 his son, Otto I, was crowned emperor of the Holy Rom. Empire at Rome by the pope. From this date the tradition to which the Ger. rulers jealously clung, that he who had been crowned Ger. emperor at Aachen was entitled also to be crowned king of Italy at Milan and emperor at Rome.

From 1024 to 1125 G. was governed by Franconian emperors. The most noteworthy is Henry IV. (1056–1106), whose profound humiliation before the haughty Hildebrand at Canossa (1075) still remains one of the most dramatic episodes in hist. Ever since Otto I. had revived the title of Rom. emperor, there had been a rivalry, which daily assumed larger proportions, between emperor and pope. But in Henry IV.'s day the papacy was supported by a number of Christian sovereigns, among whom the Ger. emperor was not necessarily pre-eminent. It is clear at least that Gregory VII. was determined once for all to assert his freedom from imperial domination. Thus disregarding the very foundations of the feudal system, which was estab. in G. as elsewhere, he refused to allow any officers of the church to do homage to a temporal lord, and insisted that the papacy alone should exercise the privilege of investiture. Henry exerted all his powers in opposition to Gregory, but the latter, by formally deposing and excommunicating him, made his life so intolerable that he preferred to

stand for three days clothed in sackcloth and with bare feet amid the pelting snows of Canossa rather than go home without the papal pardon. The pope finally received his submission, and the question of principle was thus settled, but Gregory was afterwards forced to seek exile when Henry captured Rome (1084). Though the struggle effectually ruined the Hohenstaufen dynasty which reigned in G. from 1138 to 1254, the status and position of the pope at the close of that period suggested failure rather than victory. The most celebrated of the Hohenstaufen emperors was undoubtedly Frederick



THE PALZ OR PFALZGRAFENSTEIN NEAR KAISERSLAUTERN, ON THE RHINE

A hexagonal building founded by Emperor Henry the Black (1314–47)

Barbarossa, or 'Red-beard' (1152–90). He entertained ambitious schemes of It. conquests, but the Lombard League defeated him at Legnano (1176). His successors continued his battles, and so the Guelph and Ghibelline factions, that is, the adherents of the pope on the one hand and of the emperor on the other, spread insidiously all over the empire, so that on the fall of the Hohenstaufens (1254) even the Ger. kingdom had become like the Holy Rom. Empire, a phantom. It was now split up into over 270 virtually independent states.

There now followed an interregnum (till 1273), which is important for the formation of the Hanseatic and Rhenish Leagues. The ter. were growing strong and resorted to union as the one defence against the anarchy of the times, and especially against the arbitrary oppression of the barons. In 1273 began the vicious practice of selling the imperial title to the

highest bidder. Theoretically the kingship was still elective, although four secular and three spiritual princes now claimed exclusive rights to choose the emperor. They gave the title to the count of Hapsburg, who accordingly reigned as Rudolph I. Hapsburg was the name of a paltry Swiss principality, yet the house of Hapsburg was destined to furnish a long and illustrious succession of Ger. emperors. Louis the Bavarian, emperor from 1311 to 1347, was involved in struggles both with his rival Frederick of Austria and with the pope John, who refused to recognise his title. Louis gained the support of the Ghibelline faction, and of the electors, who in 1338 stood out for their elective rights, and in the Frankfort diet denied the necessity of papal approval of the Ger. king's election. For a time allied with Edward III. of England against the pro-papal Philip of France, Louis aroused hostility by an acquisitive policy, and was saved only by his sudden death. In 1438 Albert II. of Austria was chosen emperor by the seven electors, and from that date till the dissolution of the empire by Napoleon the imperial crown may be said to have been hereditary in the Hapsburg line.

Maximilian I. (1493-1519) was one of the last of the great medieval rulers as he was also in another sense the first representative of a new order; for not only may he be said to have assured the long succession of his own family, the proud Hapsburgs of Austria, but also to have made an earnest effort towards unification and peace. Anxious to check the aggressions of Charles VIII. of France, he summoned a Diet at Worms with the result that a perpetual national peace was declared, and an imperial court was established to see that that peace was maintained. Further, the empire was divided into ten circles and districts, the object of which was to enforce the execution of the imperial chamber's recommendations.

Behind the death of Maximilian (1519) lie the Dark Ages and in front loom Luther and the Reformation. After Maximilian the steady growth of the free imperial cities showed that the people were building up an active municipal life, whilst the great Gothic cathedrals, like those of Strasburg and Cologno (begun in 1248), bear testimony to the faith and religious zeal of the masses. But although religion was thus a vital part of the lives of Ger. citizens, the great schism and the abuses produced by the sale of indulgences gradually aroused in men's minds at first a distrust and then an open contempt for the pope and for the higher clergy. The smouldering resentment was set ablaze by Martin Luther (1483-1546) in reaction against Tetzel's abuse of the indulgences for the building fund of St. Peter's at Rome. This is not the place to speak of the career of this the first, and probably the greatest, Protestant reformer. Suffice it to say his ninety-five theses were printed and circulated throughout Ger., and that, in spite of the papal bull of 1520, and that, in the great Diet of Worms of 1521, men of all ranks rallied round him, so much so that

a gathering of seven princes and many cities issued a formal protest against the intolerance of the Second Diet of Spires (1529) and thus became known everywhere as Protestants. The world-famous emperor, Charles V. (1519-56), exercised all his personal influence, and, what is more, employed the exceptional facilities offered by his exalted position as ruler over so many European states, completely in the service of Rom. Catholicism. The Peasants' war of 1525 revealed the wretched condition of the labourers and the wanton cruelties perpetrated by the Ger. barons. It was a misfortune to Luther that the Swabian and Franconian peasants should choose a critical period of his lifetime for their revolt; for his opponents fastened on him the responsibility for their insensate if excusable actions.

Charles V.'s theory that church and state were indissoluble and his uncompromising attitude towards the Protestants, sowed the seeds of the Thirty Years war. During a respite the Lutherans published a statement of their doctrine known as the 'Confession of Augsburg' (1530), and formed the league of Schmalkald, which may be regarded as the outward expression of their determination not to submit to the emperor. Soliman the Magnificent, the martial Turkish sultan, had already besieged Vienna (1529), and was advancing westward with overwhelming forces to attack the emperor's dominions. Charles lost no time in making a patriotic appeal to the Ger., to forget their differences in the face of the common foe, and in a short time was surrounded with a splendid army, more than sufficient to intimidate the Turks. To the Protestants he had granted provisional toleration by the peace of Nuremberg. The expedition against the Turks at Tunis (1535), the punishment of rebellious Ghent (1539-40), attacks on the Algerian corsairs, and two more ravaging wars with the Fr. king, Francis, kept him fully occupied till the treaty of Crespy (1544). But in the year of Luther's death (1546) he began his work of crushing the Protestant league. This proved an easy task, for at the eleventh hour Maurice of Saxony, one of the pillars of the Reformation, deserted to the imperial side, the Protestant forces broke up, and the league melted away. The leaders were executed and fines exacted from Protestant cities. But the Protestant cause was not so to be uprooted. The Saxon Maurice stoned for his former desertion, and Francis's successor on the Fr. throne was eager to snatch at any means of humbling his father's rival, and accordingly lent substantial aid to the oppressed Lutherans. At the epoch-making Diet of Augsburg (1555) Charles was obliged to make notable concessions to his triumphant foes. It was arranged that in future every Ger. prince should be allowed a free choice between the Augsburg confession—which was accepted as a summary of Lutheran orthodoxy—and Rom. Catholicism, and that once his choice was made he should be at liberty to enforce his religion upon his subjects and to drive the latter out of the kingdom should they

refuse his faith. Thus establishing the principle of *eius regio illius religio* Charles's policy was far-reaching, for it precipitated the subsequent religious wars and persecutions of the old religion in the new Protestant states.

Before leaving the reign of this emperor, who abdicated in 1556, it is necessary to say a word of his rivalry and struggles with the Fr. king. The beginning of the mischief was the defeat of Francis I. when he came forward as a candidate for the empire; the electors rejected him in favour of Charles. Thenceforward Francis and Charles engaged in four useless but bloody wars, most of the campaigns being fought in Italy, which seems to have been regarded by both as their lawful prey. On the whole the advantage was with the emperor, who at the final peace secured Naples, Artois, and Flanders, though he was obliged once and for all to renounce his claims to Burgundy, which, as a fact, had never since its acquisition in 1032 been attached to the empire by other than the loosest ties. At the time those wars declaimed the Fr. and Imperial troops, but the evil of it all was that the Fr. kings never forgot the humiliation that their predecessor, Francis, had suffered at the hands of Charles V. at Pavia (1525) and elsewhere. And it is this fact that accounts for the jealousy of the house of Hapsburg, which France ever continued to evince, and which explains primarily the vindictive policy pursued by the Bourbons and their ministers, Richelieu and Mazarin, during the Thirty Years war, and which finally enables one to appreciate the transports of joy experienced by the Fr. at the dissolution of the empire by Napoleon in 1806.

The foreign wars of Charles V. have been passed over, as their causes and results form part of European rather than of Ger. hist. A similar course will be adopted in the treatment of the Thirty Years war. The peace of Augsburg had treated the Calvinists as non-existent, yet in G. as elsewhere many had come to prefer the confession of Geneva to that of Augsburg. The result was perpetual strife among the various Protestant sects, for the Lutherans showed small mercy to the Calvinists or to any reformers who ventured to follow a different creed from that drawn up by Melanchthon. To make good their position the Catholics relied chiefly on the 'eccles. reservation' embodied in the peace of 1555. This enacted that the penalty which every bishop or abbot must pay for turning Protestant was the loss not only of his office, but of all the lands and revenues attached to it. After Charles there were two moderately enlightened emperors, and then followed Rudolf II. (1576-1612), who was an ardent Catholic. Dread of oppression impelled the Protestant states towards mutual alliance, and in 1608 a confederation was duly formed, called the Evangelical Union, the moving spirit of which was the Calvinist Prince Christian of Anhalt. This was followed, in 1609, by a counter-move on the part of the Catholics, who founded the Holy League, at the head of which was Maxi-

milian of Bavaria. It wanted small additional provocation to induce these leagues to fly at one another's throats, and that provocation was given by a band of Protestant nobles of Bohemia, who, infuriated by the vacillating policy of the emperor, marched to the royal castle at Prague, and hurled the two imperial representatives and their secretary out of the castle window.

The first chapter in the Thirty Years war (1618-48) was the subversion of the Protestant cause in Bohemia. The second chapter centres on the personality of Christian IV. of Denmark, who now came forward to stake his fortunes alongside those of his fellow religionists, the Protestants. Other notable Protestant leaders on his side were the Ger. prince, Christian of Anhalt, and Count Mansfeld, whilst ranged against them were two of the most formidable generals G. has ever produced, namely, Tilly and Wallenstein. Adversity still dogged the reformers' footsteps; Mansfeld d. shortly after his crushing defeat by Wallenstein at Dresau on the Elbe (1626), and his death was soon followed by that of the Ger. Christian; the Dan. king was utterly vanquished by Tilly at the field of Lutter; the remnants of Lutheranism were wiped out from Austria as well as from Bohemia; Wallenstein swept with his plundering armies over the greater part of N. G., and completed his destruction by breaking the backbone of the once flourishing and influential Hanseatic League. The year 1629 is marked by the retirement from the war of Christian IV., and also, as a striking pendant to that event, by the Edict of Restitution, which restored to the Catholics all the church properties which the Protestants had appropriated since the treaty of Passau (1552). Then appears a second and greater champion in the person of the Swedish king, Gustavus Adolphus, the Lion of the N., subsidised from France by Richelieu. With his advent opens the third period of the war. For the time being Gustavus changed the fortunes of the day and twice defeated Tilly, first at the battle of Leipzig (1631), whilst in the course of the second engagement Tilly received a mortal wound and d. Ferdinand, the emperor, a staunch Catholic, composed his differences with Wallenstein, who returned to the arena of bloodshed and met Gustavus on the memorable field of Lutzen (1632). Here the noble Swedo fell, though his warriors carried the day.

The final chapter opened in 1635. The war had now lost its early character of a religious conflict between irreconcilable Christians, and had degenerated, or perhaps only developed, into a European contest in which the one object of the combatants was either to despoil the empire themselves, or to hinder their rivals from territorial expansion. At last the peace of Westphalia was arranged, the terms of which were eminently prejudicial to the interests and prestige of the empire. France received a great part of Alsace and the three Lotharingian bishoprics, Metz, Toul, and Verdun; Sweden received important tracts of land in N. G., to hold as

fiefs of the empire, and the independence of Switzerland and of the Netherlands was finally acknowledged. Lutherans, Catholics, and Calvinists were placed on an equal footing, but princes might still impose their own creeds upon their states. A crushing blow was dealt to the empire; for its dismemberment was for the time being sealed by the recognition of the practical independence of the sev. states, which might even contract their own foreign alliances. It is said that the population during the brief space of thirty years from 30,000,000 to 12,000,000; the proud Hansa cities and their union were broken up; flourishing tns. were levelled to the ground, their sites being marked by charred masses and scattered hovels; agriculture was hopelessly neglected, and it was hard to find a stretch of countryside not disfigured nor wasted by the brutal devastations; industries and commercial routes were obliterated, and education, science, and the fine arts belonged to a forgotten era now glorious by contrast; patriotism and hope were dead. In fact it must, in fairness, be admitted that 'in character, in intelligence, and in morality, the German people were set back two hundred years.'

The meteoric ascendancy of Prussia forms the next great chapter in Ger. hist. Prussia, the name of which was taken from the Borussi, a Slavonic tribe of fierce pagans, lay along the Baltic coast E. of the Vistula. These had been converted and their ter. occupied by the military religious Teutonic order. In 1525 Albert Hohenzollern the Grandmaster, declaring himself a Protestant, arrogated the land to himself as a duchy independent of Poland. In 1611 the duchy of Prussia was united with the electorate of Brandenburg, and when these ter. fell into the hands of the great elector, Frederick William (1640-88), the foundation of the future greatness of Prussia may be said to have been laid. Frederick was an able ruler who determined to make himself felt in European politics. For this purpose he drilled an excellent and permanent military force. Moreover, he came forward as the champion of Protestantism, and made his dominions a place of refuge for the persecuted Huguenots. It was, however, in the reign of his son Frederick III. (1688-1713) that Prussia achieved the status of a kingdom. Frederick was succeeded by Frederick William I. (1713-40), who, in spite of his eccentricities, proved an energetic if somewhat brutal tyrant, and what was of first importance to his son, Frederick the Great (1740-86), he left a thoroughly disciplined standing army of 80,000 men. Frederick the Great was gifted with a genius for war, and it was largely on this that he relied in lifting his little kingdom to the level almost of the great powers in Europe. When the Pragmatic Sanction of Charles VI. was disregarded and the possessions of Maria Theresa were assailed, Frederick stole Silesia. His claim to his conquest was acknowledged in the peace of Aix-la-Chapelle, which ended the War of Austrian Succession (1748). The Seven Years war

(1756-63) was an attempt to humble the upstart Prussia. The empress of Austria, Maria Theresa, blazoned abroad her wrongs, and France, Russia, Saxony, Sweden, and Poland rallied round her, whilst Frederick, the robber, could rely on England alone of all the foreign nations. He defeated the Fr. at Rossbach and the Russians at Zorndorf, but his one ally deserted him. He was, however, saved by the accession to the Russian throne of Peter III., who was his enthusiastic admirer. Victory once more attended the Prussian armies, and thus, at the peace of Paris (1763), Frederick came well out of an exasperating war.

During the next epoch the historical arena is filled with the rivalry between Catholic Austria and Protestant Prussia—a rivalry for which the consistent policy of the successive Fredericks had paved the way. Napoleon's victory at Austerlitz (1805) was the death-knell of the Holy Rom. Empire, and Ferdinand II., in 1806, was obliged to content himself with the much less pretentious title of emperor of Austria. Thus the long Hapsburg ascendancy over G. was brought to an end. The confederation of the Rhine, that is, a union of sixteen Ger. states under the protectorate of Napoleon, was short-lived. The year 1815 saw the federation of thirty-nine petty kingdoms under the presidency of the Austrian emperor. At the time of the revolution in France, July 1830, there was a sympathetic wave of revolt in many quarters of G., but it was not strong enough to extort any lasting concessions from the various courts. Finally the sev. states, with the exception of Austria, entered into a commercial treaty with one another by which they agreed to set up no protective barriers between themselves, but to encourage free trade everywhere within Ger. boundaries. This treaty grew into the famous Customs Union, or *Zollverein*.

Once again in 1818, as in 1830, German patriots were stirred to open demonstrations of their dissatisfaction with the existing state of affairs by the tidings of the summary dismissal by the Fr. of the reactionary Louis Philippe, and their inauguration of another commonwealth. The govs. of the smaller states were at once intimidated into carrying into effect a series of liberal measures. In Austria the Conservative Prime Minister, the redoubtable Prince Metternich, was obliged to flee the country, and a representative Diet was summoned whose members were chosen by a popular suffrage. The same process was gone through in Prussia; a national assembly was convened and Frederick William IV. swore to observe the new constitution. The convocation at Berlin in 1848 of an assembly representative of all the Ger. states to take the place of the now effete Diet ended in failure.

William I. ascended the Prussian throne in 1861, and it was not long before he had advanced the astute and vigorous Bismarck to the premiership of his kingdom. The methods of this statesman were rough and ready. He had long made up his

mind that the sword only could cut the Gordian knot tied by the mutual jealousies of his country and Austria, and eagerly seized on the miserable disputes about the duchies of Schleswig-Holstein as an efficient *cavus belli*. Prussia was determined to annex Holstein when the royal house of Denmark, which had so far held it as a foreign dependency, became extinct in 1863. The duchy was useless to Austria, but the latter nevertheless could not brook any annexation which would aggrandise her rival. War broke out in 1866. In Aug. of the same year the peace of Prague was signed, and Austria

into the great Germanic confederation, which, in 1871, was recognised by Europe as an empire and as a nation. But this is anticipation. It is necessary to understand what occasioned the united resistance against a common danger. The Franco-Prussian war (1870-71) was really the climax of that perpetual enmity on the part of the Bourbons against the Austrian Hapsburgs, an enmity which was somehow transferred to the Hohenzollern dynasty of Prussia when that kingdom began to overtop the older seat of empire. A pretext for the commencement of hostilities was offered by the gift



W. F. Mansell

WILLIAM I OF PRUSSIA PROCLAIMED GERMAN EMPEROR IN THE HALL OF MIRRORS AT VERSAILLES

A painting by Anton von Werner

paid the penalty of her successive defeats, which had culminated in the historic battle of Sadowa (in Bohemia), by being debarred once and for all from participation in the 'Ger. Union'. It should be mentioned that this union had been formed as early as 1849, whilst Austria was preoccupied with quelling the Hungarian rebellion headed by Kossuth. It was, in short, a federation of a number of the states which agreed to recognise the supremacy of Prussia. The year after the war (1867) this earlier federation was enlarged so as to merit the title of N. Ger. Union. Frankfort, Nassau, and Hanover were now part of Prussia, and the only kingdoms of importance still outside the union were Bavaria, Baden, and Württemberg, that is the Catholic states of the S. The knowledge that a Pen-Ger. army was besieging Paris finally broke down the resistance of the recalcitrant states and forced them

of the sp. throne to Leopold, a member of the house of Hohenzollern, in 1870. In deference to the Fr. king, Napoleon III., Leopold did not accept the proffered crown, but therupon, after the manner of the wolf in the fable, Napoleon demanded a guarantee that no Hohenzollern ever should unite together Spain and Prussia, a foolish demand which was refused. The Ger. forces were better trained and better armed than the Fr. and success attended them everywhere. Thus they blockaded one Fr. army in Metz, forced another to surrender at Paris, and besieged a third in Paris. The cap. fell and the peace of Frankfort ended a war which had proved nothing but humiliation to the defeated. Alsace and part of Lorraine became Ger. once more, after being Fr. for over two centuries, and France had to pay an enormous indemnity of £200,000,000, which crippled her finances for years. But before Paris had

yielded or the war was at an end, King William I. had received from all the princes and free cities of G., whilst he was in the great hall of Louis Quatorze at Versailles, the title of emperor over a united G.

The man who mapped out the path of advance for the young empire was Prince Bismarck, who became Reichskanzler or Imperial Chancellor (1871). Broadly speaking, his aims were to concentrate all power in the person of the emperor and to fortify his dignity and the dignity of the empire by diverting as large a portion of the national expenditure as he dared towards enlarging and increasing the efficiency of the army. His policy towards the Socialists, who were constantly in revolt against his administration, was to disarm their criticism by remedying the evils against which they cried. Thus, those measures for compulsory insurance of workmen and for old age pensions, etc., measures which are sometimes described as state socialism, were really the outcome of the chancellor's recommendations. Bismarck's first struggle was with the pope. In 1872 the Jesuits were expelled, and during the next three years the famous Falk or May Laws were promulgated, their object being to undermine papal authority and to establish the legality of state interference in eccles. affairs. In 1874, moreover, the validity of civil marriage was upheld. This struggle is known as the *Kulturkampf*, and the title Falk refers to the minister who drafted the anti-church bills. The former ended in compromise, for in 1879 Falk was forced to resign, and Bismarck was later obliged to make substantial modifications in the laws.

The contest between the Reichstag and the chancellor over whether or not the former should retain a constitutional control over the army centres on the 'Septuagesima' (1874), by which the army grants were fixed for periods of seven years at a time. The second period would expire in 1888, and Bismarck was determined to make considerable additions to the peace establishment in view of the rapid increase of the Fr. military forces. Parliament stubbornly refused to countenance his plans, and accordingly was dissolved in 1887. In the election that followed the Socialists and Radicals (*Freisinnigen*) suffered a humiliating defeat. Bismarck triumphed; subsequent budgets showed an enormous increase in army supplies, and the obligations to serve was extended from twelve to eighteen years (1888). Conscription had one serious drawback, and one which Bismarck tried to remove when in his famous speech of 1885 he declared that 'Germany does not want colonies', the extraordinary increase each year in the number of emigrants, most of whom found new homes in America, seemed for the time being (1879-1884) to threaten the home country with grave depopulation. In spite, however, of Bismarck's dictum, G. had aspirations towards colonial expansion. In 1882 a Ger. colonisation society was started at Frankfort, and from that time date

the Ger. acquisitions in Africa and the Pacific, but the colonies did not prove a successful enterprise from the financial standpoint. The task of meeting the national expenditure, which increased annually, soon developed into a problem of the first importance, but for this problem as for so many others the indefatigable Bismarck was ready with a solution. The 1879 session of the Reichstag was exhausted by an animated controversy between Free Traders and Protectionists. Victory fell to the latter, and Bismarck's suggestions were in the main adopted.

Bismarck showed himself an adept in diplomacy. Ever since the meeting of the three emperors in 1872 there had been an alliance between G., Austria, and Russia, but after the upheavals in the E., G. was obliged to choose between the friendship of her two former allies. Thus in 1879 Bismarck publicly renewed amicable relations with Austria, and when Italy agreed to join the two empires in 1883, there was constituted a triple alliance which lasted down to the First World War. In his choice Bismarck was guided by the consideration that with Austria at his back there would be less danger of a combined attack of France and Russia.

In 1888 the emperor, William II., the grandson of the first Ger. emperor William I. (1871-88), ascended the throne with the determination to continue his grandfather's and Bismarck's policy. But it soon became clear that two strong personalities such as himself and Bismarck could not work together, and as he could not submit to the latter's contention that the chancellor must always be the intermediary between the emperor and his other ministers, he commanded Bismarck to send in his resignation (1890). Caprivi now became chancellor, and managed to negotiate a series of commercial treaties with the countries of Central Europe (Austria, Belgium, Switzerland, Italy), and later with Serbia and Rumania, the purpose of which was to lower the import duty on corn on condition that the foreign states favoured their manufs. (1892-94).

A wave of popular feeling which lifted high its head in the twilight of the nineteenth century was that which rose against the strengthening and reinforcement of the provisions of the criminal code known as the *Umsatz Vorlage*. A Conservative Gov. attempted to remedy the prevailing indifference to Christianity, which was undoubtedly accompanied by alarming immorality and licence, by a number of restrictive measures, introduced as amendments to the old criminal code. Unfortunately these amendments were so framed as to interfere largely with the freedom of the press and the personal liberties of the people. The proposed censorship of pictures, books, and papers gave rise to a storm of indignation, and when in 1900 the *Lex Heine* was brought forward to cope with prostitution, and to it was appended another Bill proposing to give the police censorial powers over art and literature, public feeling ran so high that the Socialists were actually applauded

for introducing obstructive tactics into the Reichstag, and the objectionable clauses had all to be withdrawn. It was against the Socialists, or rather the Social Democrats, that the emperor and Gov. turned their strongest weapons. The blow delivered against the thousand and one political communities and organisations, most of which were socialistic in tendency, was a glaring failure, as the imperial law of 1899, to the effect that 'societies of every kind might enter into union with one another,' clearly showed. Indeed the Social Democrats whom Mommsen declared in 1901 to be 'the only great party in Germany which has any claim to political respect,' embracing as they did a very considerable latitude of opinion ranging between Moderates and followers of Karl Marx, were obviously in the ascendant, as the elections of 1912 showed, and might without exaggeration be said to have included the mass of the working classes in the Protestant states.

It remains only to note one other salient feature of modern G., and that is her naval policy prior to the First World War. The emperor conceived the idea that G. was a world empire, and must have a great navy to defend her trade and exports, on which her wealth and prosperity depended. This desire for naval expansion was stimulated by the knowledge of the huge fleet which England possessed; for it was felt that, as things were, the supremacy of the latter at sea would confer upon her an overwhelming advantage in the event of open hostilities breaking out. The causes of Ger. antipathy towards England were not far to seek. To begin with both countries had had a similar industrial development; only as Great Britain had almost a century's start in the field of foreign trade and of manufs., there was in G. the natural jealousy of her rival competitor. Moreover the Liberal party in G., which played so conspicuous a part some forty or fifty years before, was always looking across to Great Britain as the seat of liberty and constitutional government; it was part of Bismarck's policy to create a revulsion of feeling and to turn this respect and admiration into jealousy and contempt, for whereas Great Britain upheld free trade he had adopted protection, and whereas her system of rule was purely parliamentary he had determined to give the Ger. constitution a solid military basis and to make imperial control a thing of reality and force. However this may be, it is patent that this antipathy reached a fever heat at the time of the Boer war, and largely accounts for the ease with which the Navy Bill of 1900 was passed, in spite of alarming increase in the naval estimates. Throughout the war the sympathy of the Gers. was entirely with the Dutch colonists, who were, of course, Low Ger. in origin, and accordingly every one of their victories was regarded as a triumph for the Teutonic civilisation. In the year 1913 it seemed that the relations between Great Britain and G. had improved, and hopes were being widely expressed that

some arrangement between the govs. might be come to by which the race in naval armaments might be checked, but the Ger. Army Bill of March 1913 raised the total of the forces by 145,000 and put their peace strength in 1914 at some 870,000. The Ger. chancellor could not yield to Winston Churchill's suggestion of 'a naval holiday.' There were also the beginnings of fiscal discontent in G. which could be overcome only by invoking an extreme patriotism. During the Austro-Serbian crisis after the murder of the Archduke Ferdinand at Sarajevo, G. refused to aid Austria against Serbia, but endeavoured to prevent Russia mobilising in aid of Serbia. There was, however, in G. a div. between the diplomats and the soldiers, and at an important council meeting at Potsdam on July 29, 1914, the latter evidently triumphed. Immediately after this meeting the Ger. chancellor made overtures to the Brit. ambas. to secure Brit. neutrality, but the 'infamous proposals' were rejected. On July 31 G. demanded complete demobilisation of Russia within twenty-four hours, but did not require the same measure from Austria. Receiving no reply from Russia, G. declared war on Aug. 1. France stood by her alliance with Russia, but G.'s declaration of war against France did not arrive until Aug. 3. The neutrality of Belgium and Luxembourg was violated by the Ger. armies, and England, receiving no assurances, declared war on G., Aug. 4. (See WAR, THE FIRST WORLD.—EVENTS IMMEDIATELY PRECEDING OUTBREAK OF WAR. *Diplomatic Exchanges.*) The Ger. people showed a remarkable unanimity over the question of war, propaganda concerning the Russian mobilisation rallying all parties, including the Socialists, to the support of the gov. policy. As the war progressed the conflict of opinion between 'Easterners' and 'Westerners' became more marked, and the rivalry between the E. and W. commands was a handicap to Ger. military aims. After the battle of the Marne had stalemated the Ger. offensive in Flanders, it was in the E. that Ger. arms were spectacularly successful. The Russians were defeated at Tannenberg, and Rumania in 1916 was put out of the war almost as soon as she had entered it. After the Marne Moltke was succeeded by Falkenhayn as minister of war, but in the rivalry between him and the victors of the E. front, Hindenburg and Ludendorff, he succumbed. Ludendorff became a virtual dictator. Both the Kaiser and his chancellor, Bethmann-Hollweg, took second place. In the Reichstag Bethmann-Hollweg had little influence, the only strong man in the gov. being the financier Helfferich. Meanwhile the Socialist minority, opposed to the continuation of the war, was increasing. Early in 1916 Hanse openly announced in the Reichstag his disagreement with the policy of the gov. However, on May Day, 1916, Liebknecht, who with Rosa Luxemburg was the author of the celebrated *Spartacus Letters*, was arrested and imprisoned. Moreover, the Auxiliary Service Bill which was passed

at this time impressed all men between the ages of seventeen and sixty into the service of the state. Diplomatically, however, G. no longer looked forward to a decisive military victory. Peace negotiations were tentatively proposed by the Ger. chancellor on Dec. 12, soon after the defeat of Rumania. The peace offers were rejected by the Allies, and the intervention of President Wilson as arbitrator was cut short by the decision of the Ger. militarists to pin their faith to the submarine. The 'sink at sight' U-boat campaign which brought America into the war against G. was at first comparatively successful, and this, combined with the disaffection of Russia, made Ger. prospects bright at the beginning of 1917. Austria however, since the death of Francis Joseph in Nov. 1916 was anxious for peace, but the Emperor Karl was unable to come to terms with Italy, and Austria was forced back into line with G. (see also AUSTRIA-HUNGARY). In domestic affairs G. was troubled. In June 1917 Bethmann-Hollweg was ousted by the military party and was succeeded by the even more ineffective Michaelis, who was shortly after replaced by Count Herlitz. The Socialist agitation towards peace and parliamentary reform was now joined by the Majority Socialists, represented by Ebert, Scheidemann, David, and Müller, who were opposed to both annexations and indemnities. The Minority Socialists, represented by Haase, Bernstein, Ledebour, and Kautzky, wished, in addition, to compensate Belgium and to take a plebiscite in Alsace-Lorraine. In the beginning of 1918 there was a strike in the munition factories, fostered by the Independent Socialists and Spartacists. It was suppressed, but by June it was admitted by von Kuhlmann, secretary of state for foreign affairs, that the war could not be ended by a military success. Adm. Tirpitz formed a 'Fatherland party', but its influence was not great enough to resist the forces disrupting the empire. At the eleventh hour Prince Max of Baden was called upon by the Kaiser to form a Cabinet to overthrow absolutism and introduce parliamentary government. After the failure of Ludendorff's final offensive Prince Max signed the petition for an armistice. On Nov. 5, 1918, conditions were announced, and included evacuation of all occupied ter., withdrawal beyond the Rhine, together with a neutral zone on the r. b., and the surrender of all guns, aeroplanes, and ships. The naval mutiny at Kiel which had broken out on Nov. 4 marked the collapse of the will to war, and on Nov. 9 a republic was proclaimed in Berlin. The same day the Kaiser abdicated and fled to Holland. A provisional gov. under Ebert replaced that of Prince Max, and the terms of the armistice were accepted. The Majority and Minority Socialists united in this gov. and a Cabinet of six was formed, called the Council of the People's Commissaries. Opposed to them were the Workers' and Soldiers' Councils animated by the Independent Socialists and the Spartacists (Communists). At a meeting of repre-

sentatives from the state assemblies, Ebert endeavoured to pave the way for the National Assembly which was to meet to decide the constitution. The date of meeting was fixed for Feb. 14, 1919. The Spartacists were against the holding of a National Assembly, being in favour of a Soviet regime, and a conflict became inevitable. Noske, a member of the People's Council, accepted the task of upholding the bourgeois republic against the Communists. The forces at his disposal were small, but he trained others. On Jan. 5, 1919, there was a rising of the proletariat which would have succeeded in overthrowing the gov. had the leaders shown greater decision. A revolutionary committee did indeed set up a gov., declaring Ebert to be deposed. On Jan. 10 Noske's troops took command of the city. There was severe fighting, during which Rosa Luxemburg and Liebknecht, the leaders of the Spartacists, were brutally killed. On Jan. 19 the election was held for the National Assembly, which was summoned to meet on Feb. 6. The assembly met at Weimar, and after deliberation and amendment the provisional constitution was adopted. Ebert was elected president, while Scheidemann formed a Coalition Cabinet, containing eight Majority Socialists, four Democrats, and three of the Centre party. The new gov. attempted some financial rehabilitation, but all measures were unstable, pending the presentation of the allied terms of peace. These were received by G. on May 7. There was an immediate outcry against their acceptance. They involved tremendous sacrifices of ter., the payment of reparations in money and produce, and also complete disarmament. The Independent Socialists were the only party in favour of unconditional acceptance. Scheidemann, believing the Reich to be doomed in either event, resigned on June 19. Bauer (q.v.) formed a gov. for the purpose of accepting the terms with reservations over the question of the admission of G.'s war guilt and the surrender of the so-called 'war criminals.' He obtained sufficient support with the help of the Socialists and the Centre party. The Allies rejected the reservations, and demanded unconditional acceptance. This was at length forthcoming, and G. signed the treaty of Versailles (q.v.), which came into force from Jan. 1920. The terms of the treaty were so severe that the gov. which had accepted them became unpopular in the country, and this unpopularity was fostered not by the Communists, whose hopes had been destroyed at Weimar, but by the reactionaries—disbanded soldiers and royalists. A counter-revolution, known as the Kapp putsch, was set on foot on March 28 by Dr. Kapp and Gen. Luttwitz. Ludendorff lent his countenance to the movement, but Kapp's initial success was short-lived. For a week he acted as chancellor, the Ebert-Bauer Gov. having fled to Stuttgart, but Berlin was isolated by a general strike, and Kapp was put to flight. A similar movement overthrew the Bavarian Gov., but the leader, Hitler,

who planned to march on Berlin, did not find his chance until ten years later, when in the elections of 1930 he put himself at the head of the 'Nazi' party and combined with the Nationalists to create a Fascist G.

After the Kapp *putsch* the chancellor Bauer lost his prestige, and was succeeded, on May 27, 1920, by Müller, with Wirth as finance minister. The Müller Gov. paved the way for the general elections of June 6, in which the Socialists lost ground. A Coalition Gov. was formed on June 20, with Fehrenbach as chancellor. The prin. work of this ministry was in connection with reparations. (1. received the estimated allied demands at the conference at Spa in July, and for the next ten years the question of reparation payments dominated the foreign policy of G. (see under REPARATIONS). At this time also the allied demands for disarmament within the treaty limit of 100,000 men became pressing, and were the basis of the Paris terms of Jan. 1921. They were countered by a widespread secret traffic in armaments and the formation of societies devoted to the purposes of military training. Foreign affairs at this time centred also on the Silesian plebiscite in which (1. polled some 700,000 votes to Poland's 500,000, while 664 coms. were for G. and 597 for Poland. G., however, was disappointed by the boundary line which the League of Nations eventually drew through the dist., the Allies being unable to agree among themselves. In May the London ultimatum with respect to reparations was presented to G., and Wirth succeeded Fehrenbach as chancellor of a gov. prepared to accept the ultimatum. As a result, however, of the Silesian award and the fall of the mark consequent on the effort to meet reparation requirements, G. by July 1922 was no longer able to cover her obligations, and the following year the Ruhr dist. was occupied by Fr. and Belgian troops (see under RUHR).

This drastic move, however, had been preceded by allied conferences, the chief of which was at Cannes at the beginning of 1922, but the effort to recognise G.'s limitations was thwarted by the recall of Briand to Paris. At the economic conference at Genoa which followed in April, G. secured some definite result by concluding a treaty with Soviet Russia, renouncing mutual indemnities and conceding economic advantages, and this treaty further antagonised the Fr. The Ger. policy of passive resistance to the Fr. occupation of the Ruhr was initiated by chancellor Cuno, who succeeded Wirth on Nov. 11 1922. With the failure of the Ger. policy in the Ruhr to secure anything except impoverishment of the country, Cuno went out of office, and Stresemann came forward and formed a Cabinet in Aug. 1923. The problems which confronted him were to liquidate the struggle in the Ruhr, to restore internal order, and to stabilise the mark. The order for passive resistance was withdrawn on Sept. 27, and this step was only opposed by Bavaria where a separatist movement was

aiming at the restoration of the Bavarian monarchy and the overthrow of the Ger. republic. It assumed serious proportions, but was divided into two parties, one purely monarchist under von Kahr, the other Fascist under Hitler and Ludendorff. Owing to this div. the plans of both parties miscarried (see under BAVARIA). In Saxony also there was a revolt against the Reich on the part of the Communists, and a Republican Proletarian Gov. was set up. Stresemann issued an ultimatum, ordering this gov. to resign, and appointed a military commissioner with dictatorial powers. To cope with the financial problem Stresemann inaugurated a Powers Bill which would give him special powers to act on his own initiative while keeping within the bounds of parl. gov. After resigning formally and returning with a new finance minister in Dr. Luther, Stresemann passed the Bill. The mark was then stabilised by the method of abolishing the old currency and substituting a new one. The introduction of the *rentenmark* scheme was retarded by a strike, and it became necessary to appoint Gen. von Seeckt dictator. Through his efforts the activities of the Ger. Fascists and Communists ceased to interfere with the State. Eventually in Nov. 1924 Wilhelm Marx, chairman of the Ger. Centre party, formed a Cabinet, with Stresemann as foreign minister. A second Powers Bill was passed. Economic stabilisation was further helped by the introduction of the Dawes plan (q.v.), which secured the evacuation of the Ruhr and put the question of reparation payments on an economic basis. The London Conference in 1924, at which the Dawes plan was adopted, paved the way for the Locarno treaties (q.v.) the following year, and for G.'s entry into the League of Nations in Sept. 1926.

On Oct. 20, 1924, the Reichstag was dissolved, and at the subsequent elections in Dec. the extremist Communists and Nationalists both lost a number of seats. During this period of transition towards more stable conditions, President Ebert d. on Feb. 21, 1925. According to the constitution of that time the president had to be elected by direct vote and an absolute majority. F.-M. von Hindenburg was put forward as a candidate, and although this appeared a reactionary move, he was elected to the presidency, in which office he remained until his death. Hindenburg pledged to uphold the republic, exerted his utmost to reconcile the Royalists with the Republicans. At this time Luther was chancellor, and Stresemann, who was foreign minister, concluded the Locarno treaties with France, Belgium, Great Britain, and Italy. Before these treaties were ratified by G., however, Luther's Gov. was forced to resign, but was returned a month later, Jan. 1926, Stresemann again being foreign minister. The Locarno treaty was followed in April 1926 by a treaty with Soviet Russia much in the spirit of Locarno, but giving assurances that G.'s treaties with the W. powers were not directed against Russia. When Dr. Marx

became chancellor in Jan. 1927 Stresemann was again foreign minister, and the Locarno treaty and the League of Nations continued to receive Ger. support as a means of securing equality of treatment. In Feb. the Inter-Allied Military Commission of Control was withdrawn, and the chief obstacle was thus removed from the hitherto secret reconstruction of the Ger. Army.

Stresemann, who was working towards the rehabilitation of G., by gradual means, among which was the revision of the Dawes plan, was handicapped by the Nationalist element in the Marx Cabinet. With the fall of the gov. in 1928 the Socialists gained in the ensuing elections, and Stresemann became foreign minister, this time in a gov. with the Socialist Müller as chancellor. In these elections the National Socialist or Nazi party won twelve seats with a total of over 800,000 votes—evidence of the success with which Hitler had built up the party since its eclipse in the Munich *putsch* of 1923. The following year the Young plan superseded the Dawes plan, and the Allies agreed to evacuate the Rhineland by June 1930. The first stage in the reconstruction of G. was thus complete, and the end of the period is marked by the death of Stresemann (Oct. 3, 1929), his work largely accomplished.

Stresemann's methods had not, however, been thoroughgoing enough to please the Ger. Nationalist party, which was loud in its denunciation of the Young plan. Hugenberg, the leader of the Nationalists, became allied with Hitler in their joint opposition to the plan, and as a result the financial power of the industrialists and the propaganda machine of the Nationalists were of service in building up the Nazi party. The Socialist influence waned, and in Dec. 1929 Müller was succeeded by Brüning, leader of the Catholic Centre party. Brüning did not have a majority in the Reichstag, and governed mainly by decree during the two years he remained in office. In 1930 the Reichstag was dissolved, and the elections were a triumph for the Nazi party, which gained 107 seats as against their previous twelve, with a total vote of nearly 6,500,000. Hitler now sought to consolidate his victory by directing National Socialist propaganda against the Jews and Marxists, the alleged injustices of the Versailles treaty, and the Republican system of gov. Still in alliance with Hugenberg and with Dr. Schacht, former president of the Reichsbank, he became more open in his hostility to Brüning. But while his following and that of Thaelmann, the Communist leader, were large enough to disrupt parl. government, Ger. radicalism had not yet reached the point at which President Hindenburg and the Junkers were seriously threatened, and for a time the aged marshal became G.'s dictator. The accentuation of the world economic depression then began to turn the scales, and in the succeeding elections Hitler's following grew even larger until, when he stood against Hindenburg in the presidential elections in 1932, he secured

over 13,000,000 votes. Hindenburg was nevertheless elected by a majority of 6,000,000, and notwithstanding Hitler's success in the Reichstag elections Hindenburg denied him the chancellorship. In the Nov. election of 1932 Hitler actually lost ground, and Gen. von Schleicher, who became chancellor, tried to bring about a *coup d'état*, having for its double aim the removal of Hitler and of the reactionary clique around Hindenburg. This cabal, however, supported by a number of disillusioned industrialists and bankers, who hoped to restore their fortunes with financial aid from a gov. under Hitler, now decided to get rid of von Schleicher and to substitute Hitler. At the time when the cabal reached this decision and persuaded Hindenburg to make Hitler chancellor over a mixed Cabinet of Nazis and Nationalists, there is no doubt that they hoped Hitler would prove no more than a compliant figurehead, amenable to the wishes of the non-Nazi Nationalist party (Jan. 1933). But they had now set flowing a Nazi tide which was destined very soon to sweep down all barriers. Hitler's first act, as unscrupulous as all that since characterised his every move in both domestic and foreign policy, was to stage the Reichstag fire, the responsibility for which he placed on the Communists. By this means he was able to restrict the activities of both Communists and Socialists at the subsequent elections, for not a few believed that he had saved G. from a threatened Communist uprising. It is noteworthy that even at this date (March 1933) he had no majority otherwise than by alliance with the Nationalist party, and that in spite of the unfair manner in which the election of that month was held. But he now had the substance of power, and could afford to disregard forms, though, having forcibly expelled the Communist and other opposition deputies, he went through the farce of obtaining from the Reichstag an Enabling Act, whereby he now meant to rule as a dictator, compelling submission by means of troops and secret police—*Sturmabteilung* (S.A.) and *Schutzstaffel* (S.S.) and *Geheime Staatspolizei* (Gestapo) (see also S.A.; S.S.). His intensive propaganda three years previously had made a point of deriding the Republican polity. Now he could give the old constitution its death-blow. Their constitutional liberties gone, no resistance by any elements of the Ger. people could now avail. All opposition parties were suppressed, including even the Nationalists, who had naively believed that Hitler would be their tool. As yet, however, Hitler did not show his hand in foreign affairs—apart from the fact that in its general outlines his policy could have been found in *Mein Kampf*. For the next few years he intended to consolidate his position by giving the world the impression that he really believed himself to be the bulwark against Bolshevism (see ANTI-COMINTERN PACT), besides being a respecter of international obligations. He had not, however, disposed of all opposition and, like Mussolini in the case of the ill-fated Matteotti, the

Ger. dictator himself murdered or caused to be murdered those within the Nazi party who still offered resistance. This incident took place in the middle of 1934, when the armament firms, whose concerns had been reorganised with Gov. subsidies, and the general staff were urging Hitler to throw all Socialist schemes to the winds and concentrate on a policy of Ger. imperialism backed by armaments. Hence on June 30, following a secret meeting in the house of Dr. Krupp at Essen, the Socialist or radical wing leaders were suddenly arrested and executed. These included a Capt. Roehm, chief of the S.A., the man to whom Hitler was largely indebted for his triumph, and various other leaders of that body and also a number of non-Nazis, including Gen. von Schleicher and von Kahr, now an aged man, who had suppressed the Munich *putsch*, and many Catholic politicians.

Now it was that Hitler began to put into execution his policy of interference in the affairs of neighbouring countries, and, notwithstanding his previous pledges not to meddle with Austria, he contrived, through a diligent use of fifth columnists (see FIFTH COLUMN), to bring about a rising of the Anstri Nazis and the assassination of Dörfuss, Austrian chancellor. The immediate result of this was the mobilisation of the R. Army by Mussolini, who at that time would seem to have had sufficient foresight to appreciate the seriousness of the menace of Ger. armed intervention in Austria. Soon after these events Hindenburg d. (Aug. 2, 1934), and Hitler, having gerrymandered plebiscites in his own favour by intimidation and fraud, became both president and chancellor and, later, adopted the title of Fuehrer, appointing a number of Gauleiter (dist. leaders) or nominees to act in the various provs. or former state of G.

Attention was now focused on the Saar dist., in which a plebiscite was held on Jan. 13, 1935, under the terms of the Versailles Treaty to determine whether this area should return to G. The Nazi propaganda campaign was such that the result was a foregone conclusion, and on March 1 the important mining dist. of the Saar was returned to G. by a majority of over 90 per cent. The plebiscite safely over, Hitler's next move (March 16) was to denounce the armament clauses of the treaty of Versailles, and to declare G.'s intention of re-establishing compulsory military service. An army of 550,000 men was planned in place of the 100,000 permitted by the treaty. In the same year (June 18) an Anglo-Ger. agreement on naval ratios was concluded, under which appeasement policy the Brit. Gov. allowed G. to build up to 35 per cent of Brit. naval strength (see NAVY; SEA POWER). G.'s next act was to defy the Locarno Treaty, adherence to which Hitler had himself reaffirmed. Both this treaty and the treaty of Versailles were repudiated when on March 7, 1936, the demilitarised Rhineland zone was reoccupied by Ger. troops. France and Britain made no opposition, their fears in some sort allayed by Hitler's undertaking not to fortify the zone, and

by his declaration that 'he had no territorial demands to make in Europe.' Relations between France and G. inevitably deteriorated, particularly as the result of the clash of interests aroused by the Sp. civil war. A crisis arising from the alarm that G. was infiltrating into Sp. Morocco was only narrowly averted. The end of the Abyssinian war brought a *rapprochement* between Italy and G., and the so-called Berlin-Itome axis came into being in the autumn of 1936. This was followed on Nov. 25 by the agreement which G. signed with Japan. Announced as a defence against the interference of the Communist International in the internal affairs of the nations, this agreement was viewed as a dangerous military alliance by the rest of the world.

The following year (1937) G. continued to work towards a position of self-sufficiency, and to emancipate herself still further from the Versailles Treaty. The agitation for the return of the former Ger. colonies was intensified. Intervention on behalf of Gen. Franco in the Sp. civil war also helped to bring G. and Italy into line with each other in a joint policy versus the rest of Europe. The Italy of Mussolini accordingly joined the Ger.-Jap. Anti-Comintern Pact in Nov. The strengthening of the anti-Bolshevist element in National Socialism became a means of building up the corporate state, in which the lives of its members, almost from infancy, were directed solely for the benefit of the State. The firmer grip which the Nazi regime took on the lives of the people brought it into conflict with both the Protestant and Catholic Churches. Both churches were persecuted, and there were numerous arrests of clergymen, notably that of Pastor Niemoller on July 1. With the resignation of Dr. Schacht from the post of minister of economic affairs on Nov. 26, the harnessing of industry to the needs of the State was further evident, and the ministry was taken over temporarily by Goering, to whom was entrusted the direction of the Four Year Plan, begun in Oct. 1936. By the spring of the first phase of Nazi war economy was completed; the point of 'full employment' had been reached through rearmament and an unlimited spending policy. Expenditure on armaments, however, continued to increase, and the requisite resources were obtained partly by reducing the consumption of the people, partly by loyly on the Jews and other minorities, and partly by enforced measures of rationalisation and extended hours of labour (trades unions had long been suppressed). It was now that G. emboldened by previous successes and by the knowledge that she alone among the nations was rearming at top speed, began the policy of piecemeal absorption of European ter. (see further under WAR, SECOND WORLD, and 'MEIN KAMPF'). In each case the technique was the same - to trump up charges of ill usage of Ger. minorities or nationals, and stir up disorder with the aid of spies, coupled with the widely disseminated but hollow

allegation of the hostile encirclement of G. Steps taken by other nations in self-defence were inevitably construed as proofs of encirclement. By the Franco-Soviet Pact of 1935 France had, to some extent, played into Hitler's hands. This pact, designed as a counter to G's re-introduction of compulsory military service, the reoccupation of the Saar valley, and the Anglo-Ger naval ratio agreement, was promptly seized on by Hitler as a justification for the denunciation of the Locarno Treaty and the re-occupation of the Rhineland. So long as the Rhineland zone had remained demilitarised G was denied the use of her network of strategic railways in the zone

Bloomberg and Fritsch were dismissed. Hitler became commander-in chief and Gen Keitel was raised to be his chief of staff. On the political side the conservative Baron von Neurath gave place as foreign minister to Joachim von Ribbentrop, until then German ambassador in London. The way was now ready for expansion. On Feb 12 Dr von Schuschnigg, the Austrian chancellor, was summoned to Hitler's residence at Berchtesgaden, and forced under threats to sign an agreement opening the way to Nazism in Austria. When Schuschnigg on returning to Austria proposed to hold a plebiscite to determine the union with G Hitler, fearing the result, invaded Austria, which



THE GERMAN INVASION OF AUSTRIA, MARCH 1938
A Munich infantry regiment crossing the frontier at Kiefersfelden in Bavaria

and in the Phineland for the forward concentration of her armies. G was therefore forced back to the line Cassel-Wurzburg which might have meant that the first clash between Fr and Ger forces would be on Ger ter — always the aim of the Fr general staff. The offer by G of a substituted zone would have been valuable to France who, in order to offset her inferiority in numbers, had constructed the Maginot line.

There was, however, still some opposition in G to Hitler's policy of Nazi domination of Europe. His plans were therefore preceded by a change in the direction of the army and of the Foreign Office. The commander-in chief, F M von Bloomberg, was subservient to Hitler but was unpopular with the more conservative of his colleagues. These generals, led by Gen von Tritsch, took exception to von Bloomberg's marriage, said to be beneath his rank and dignity. In the trial of strength that ensued both von

was occupied without resistance. On March 13 the union of G and Austria was announced. Hitler made his customary proclamation that he had no further territorial demands to make in Europe, and Marshal Goering was instructed to inform the Brit Govs that Czechoslovakia would not be attacked. Italy's acquiescence in the annexation of Austria served outwardly to strengthen the ties with which she was bound to G, and the accord between the two countries was affirmed at a meeting between Hitler and Mussolini in Rome during May. Thus Italian support was assured for Hitler's next move against Czechoslovakia. Propaganda was intensified on behalf of the Sudeten Germans in Czechoslovakia, while to protect G in the W the fortification of the Siegfried line was hastily erected. In Sept the crisis came to a head. G demanded the cession of the Sudetenland under threat of war. These demands were formulated by Hitler at

conferences with the Brit. Prime Minister, Neville Chamberlain, at Berchtesgaden on Sept. 16 and at Godesberg on Sept. 22. Finally on Sept. 28 a conference was held at Munich between Hitler, Mussolini, Chamberlain, and Daladier, at which Hitler gained his demands. The Sudeten Ger. dists. were accordingly occupied and the Czech fortifications taken over. An Anglo-Ger. declaration repudiating war was signed on Sept 30, followed in Dec. by a pact between G. and France. Neither of these agreements, however, served to prevent the deterioration of the European situation.

In order to pay for her successive ventures G. fell heavily into debt, and it was with the aim of earning their economic difficulties that the Nazi party organised one of the worst pogroms against the Jews in Nov. 1938. By various decrees in Nov. and Dec. the Jews were dispossessed of shops, houses, and farmlands, and the Jewish pop. generally was ordered to pay a collective fine amounting to the equivalent of over £80,000,000. Economic pressure and the wish for raw materials turned Hitler's attention towards the Ukraine, and hostility began to be shown towards Poland as being an obstacle to Ger. expansion in the E. The return of Danzig was demanded, and the demands renewed in the early part of 1939. This made nonsense of Hitler's assurances that the annexation of Czech Sudetenland was his last territorial claim, and his further assurances that he wanted no Czechs and that he was no longer interested in the Czech state were set aside when on March 15 the Czech president, Dr. Hacha, was summoned to Berlin. As a result the Czechoslovak state was dismembered. A Ger. protectorate was set up over Bohemia and Moravia, incorporating over 8,000,000 Czechs in the Ger. Reich, while Slovakia was formed into a republic, nominally independent but subject to G. This move was accompanied by a trade drive in Rumania and the Balkans, resulting in barter agreements to give G. the food-stuffs so greatly needed in exchange for manufactured articles.

In the E. Lithuania was subjected to the now familiar technique, and on March 21 the Lithuanian foreign minister, summoned to Berlin, was compelled to sign an agreement ceding Memel to the Reich. As regards Poland, Hitler, on April 28, denounced the Non-Aggression Pact concluded with Poland in 1934 and also the Anglo-Ger. naval agreement of 1935. To offset the supposed encirclement of G. by Great Britain, France, and Poland, a military alliance was made with Italy, thus openly directing the Berlin-Rome axis towards war. The demand for Danzig became more menacing with the accompaniment of frontier clashes. Hitler was undeterred by the Brit. promise of support for Poland, which he countered by a non-aggression pact with Soviet Russia. This was concluded on Aug. 26, and for the sake of it Hitler reversed the anti-Communist policy on which hitherto the Nazi state had been

largely based. Secure as he imagined from a war on two fronts Hitler forced the issue with Poland, which was invaded on Sept. 1. Great Britain and France then declared war on G. on Sept. 3 (see POLISH CAMPAIGN IN SECOND WORLD WAR).

The Polish campaign lasted not more than a month. G. was, however, forced to agree to Russian annexation of half the Polish ter., while at the same time Russia strengthened her position in the Baltic by securing bases from Latvia, Lithuania, and Estonia. G. entered the year 1940 increasingly dependent on Russian supplies, but the Russian invasion was unpopular in G. A supposed attempt on Hitler's life by a bomb explosion at Munich on Nov. 23 was thought to be the result of disunity in the country. Whether genuine or not, the incident was used to excite loyalty towards Hitler and hatred against England. In spite of the successes against Poland, it was a miserable winter for the Ger. people. Food was scarce and transport in a poor state. Nevertheless G. continued to build up its offensive strength in the W. With the spring of 1940 came the period of renewed military success. Norway was invaded on April 9 to protect the transport of iron ore from Sweden, which was essential to Ger. armaments. The invasion of the Netherlands, Belgium, and Luxembourg followed on May 10. With the occupation of these countries and the surrender of France, fighting in Europe had come to an end by July. Plans were made for the invasion of Britain, but the offensive and defensive successes of the Brit. Air Force caused these plans to be abandoned. Politically Hitler now sought to maintain his prestige by dictating settlements for the differences which prevailed between Hungary and Rumania, Slovakia and Bulgaria. These countries were accordingly brought within the orbit of G. The New Order in Europe was launched, by which the economy of each European country was linked to that of G. and made to subserve the aims and ambitions of the master people, the Ger. *Herrenvolk*. Meanwhile it was Hitler's hope to guard against Amer. intervention by means of a ten-year pact with Italy and Japan, concluded on Sept. 27, 1940. The mutual military and economic support which the three countries guaranteed to each other in the event of attack by a country not at that time at war was held to be directed towards the U.S.A. It did not, however, serve to hinder Amer. economic aid to Britain. Hitler's New Order meant the subjugation of the peoples of Europe to work for G., and the organisation of foreign labour was pushed forward in order to keep up the supply of men and materials necessitated by the Ger. campaign in Greece and the invasion of Russia. Luxembourg, Alsace-Lorraine, and part of Yugoslavia, formerly belonging to Austria, were incorporated in the Reich during 1941.

Political events which preceded the invasion of Russia on June 22, 1941, were a tightening of the bonds which reduced

Bulgaria, Rumania, and Croatia to the status of vassal states of G. Rumania, Finland, Hungary, and Slovakia lent armed aid to G. against Russia. At the same time a pact of friendship was concluded with Turkey. The war against Russia naturally gave great impetus to a revival of Ger. anti-Bolshevist propaganda. A conference was held in Berlin in Nov. to which countries in sympathy with the anti-Comintern Pact were invited. The Chinese puppet gov. in Nanking adhered to the pact at Jap. instigation, and was recognised by G. as the legitimate Chinese Gov. In Europe, however, Sweden, Switzerland, and Portugal withheld the overtures of the Gers. The prolongation of the war bringing reverses to the Gers. In Russia and N. Africa meant in the Ger. Reich itself an intensification of propaganda to stiffen morale and a tightening of the grip of the Gestapo. The New Order in Europe gave way to Ger. domination, and the appearance of collaboration began to disappear, particularly in relation to France. The persecution of the Christian religion and of the Jews continued. The former was led by Martin Bormann, who when Hess made his sensational flight to England in 1941, succeeded him as Hitler's deputy. By a decree in 1943 the Jews ceased to have any legal existence. The predominant position of the Gestapo was emphasised by the appointment of Himmler, leader of the S.S., to the post of minister of the interior. His position was further strengthened the following year as a result of the attempt on Hitler's life on June 20, 1944. This plot to destroy Hitler by a bomb explosion was organised by a number of high-ranking officers in the army. Hitler escaped with minor injuries, but a few of those around him were killed. Reprisals were severe, and were conducted by Himmler, who became supreme commander of the home army. He was thus the leader of the Volkssturm, an army on the model of the Brit. home guard, which was levied in Oct. He was at this time at the height of his power, and it was he in place of Hitler who read the address to the people on Nov. 23, the anniversary of the Nazi putsch in Munich. Defeatism was everywhere ruthlessly suppressed, especially in the face of the Russian advance in the E., and an example was made of high officials, notably the deputy burgomaster of Breslau and the mayor of Königsberg, who were executed in the early months of 1945. In the W. the morale of the fighting forces was rallied for the offensive in the Ardennes, launched by Gen. Rundstedt. In Jan. 1945 the Russian advance again went forward, and the allied offensive in the W. began the following month. The leadership of the Nazi party began to disintegrate. Goering made a bid for the dictatorship, was discredited, and superseded as commander-in-chief of the Luftwaffe by Gen. Ritter von Greim. Himmler on his own initiative made an offer of surrender to the Brit. and Amer. forces through the intermediary of Count Bernadotte, but his offer was rejected. He then

fell from power, and when he was eventually captured by the Allies on May 24 he committed suicide.

On May 1, 1945, Adm. Doenitz broadcast the death of Hitler. It is now generally estab. that Hitler committed suicide in the last hours before Berlin fell into Russian hands. Doenitz announced himself as Hitler's successor, and proceeded to set up a gov. with Count Lutz von Schwerin-Krosigk as foreign minister. His gov. was centred at Flensburg, but did not survive the unconditional surrender which Doenitz announced by wireless on May 6. He was arrested as a war criminal and his gov. dissolved. The official terms of surrender were signed in Berlin in the early hours of May 8 by F.-M. Keitel for the Ger. Army, Adm. von Friedeburg for the navy, and Gen. Stumpf for the air force. G. was divided into zones of occupation, roughly corresponding to the areas conquered by each of the allied armies. The normal life of the country had come to a standstill. Nearly all the large cities suffered severe damage from bombing, and the countryside lost much either as a result of the actual fighting or by the Gers. themselves in their retreat. An Allied Control Commission was set up, consisting of the allied commanders-in-chief, Gen. Eisenhower representing the U.S.A., F.-M. Montgomery for Great Britain, Marshal Zhukov for the U.S.S.R., and Gen. de Lattre de Tassigny for France. The commission held its first meeting on June 6, and announced that it had taken over all powers of government.

The policy to be followed towards defeated G. was decided by a three-power conference held at Potsdam in July and attended by President Truman, Marshal Stalin, Mr. Winston Churchill, and Mr. Attlee (see POTSDAM AGREEMENT). The main decision of the conference was that the political and economic life of the country was to be decentralised. All laws of Nazi origin were to be abolished, and reorganisation of the judicial system and of education was to follow. There was to be complete disarmament and elimination of war potential. The W. frontier of Poland was fixed provisionally on the Oder-Niße line, thus giving Prussia E. of the Oder and Silesia to Poland, also the S. part of E. Prussia, including Danzig, Königsberg and the N. part of E. Prussia was allotted to the U.S.S.R. As a result of the Potsdam Conference the zones of occupation were given a demarcation slightly different from the areas originally taken up by the occupying armies earlier in the year. The Brit. zone included the Ruhr, N. Rhineland, Westphalia, Hanover, Oldenburg, Schleswig-Holstein, Hamburg, Lippe, Schaumburg-Lippe, Brunswick, Heliogoland, and the Frisian Is. The Amer. zone included Bavaria, part of Württemberg, Bremen, Waldeck, Hesse, and Hesse-Nassau, and Baden. N. of and including Karlsruhe. The Russian zone included Mecklenburg, Brandenburg W. of the Oder, Anhalt, Thuringia, and Saxony. The Fr. zone included S. Rhineland, the Saar basin, the

Rhenish Palatinate, Baden S. of Karlsruhe, and part of Württemberg. Berlin was created a fifth zone, divided into occupational areas among the four powers. In July Gen. Koenig succeeded Gen. de Tassigny as the representative of France on the Allied Control Commission. One of the first problems facing the commission was the supply of food. The world shortage of wheat, combined with insufficient transport, made it difficult to maintain an adequate ration. As great a task was provided by the numbers of homeless and wandering people, displaced persons as they came to be known, a category numbering some 8,000,000. After some months the majority were settled in their former homes. There remained about 500,000 for which U.N.R.R.A. (see UNITED RELIEF AND REHABILITATION ADMINISTRATION) became responsible.

By 1946 the four zones of occupation had hardened almost into the semblance of separate states. In the Brit. zone the foremost problems were the provision of food and the production of coal. Permission was granted for the formation of political parties with the prospect of free elections at a later date. The leading political parties were the Social Democratic led by Dr. Kurt Schumacher, the Communists, and the Christian Democrats. Minor parties were the Democratic Socialist Union under Erich Koch and the Catholic Centre under Dr. Hammacher. A start was made with local government in Hanover with the creation of a number of nominated representative councils. Parallel with the growth of political activity went the process of denazification. Education was restarted, a free press set going, and a postal system operated. In the Amer. zone the transfer of administrative authority to Ger. was carried further than in the Brit. zone at this stage. As early as the autumn of 1945 three *Länder* or states were created, and in each a Ger. Gov. was set up with executive and legislative authority under U.S. military supervision. The *Länder* were (1) Bavaria within its 1933 boundaries less Lindau (in the Fr. zone); (2) Württemberg-Baden, comprising the former states of Württemberg and Baden less those areas in the Fr. zone; (3) Greater Hesse, comprising Hesse-Nassau and the greater part of the former prov. of Hesse. In the Russian zone anti-Fascist political life was resumed as in the other zones. The Social Democratic, the Communist, Liberal Democratic, and Christian Democratic parties were the most active. Wilhelm Pieck and Walter Ulbricht, former leaders of the Communist party, returned to Berlin under Russian auspices, the former to become chairman of the party's central committee. Not without Russian pressure proposals were set on foot to fuse the Social Democratic party with the Communists. This caused a split in the Social Democratic party, and the dissension spread to the other zones. In the W. zones a plebiscite revealed a majority in favour of the anti-fusionists, of whom Dr. Schumacher was the chief protagonist. In the Russian zone the

fusion was formally effected in June 1946, and Pieck and Otto Grotewohl, the fusionist leader of the Social Democratic party, became joint chairmen of a single Socialist Unity party. The 'Independent' Social Democrats held a conference at Hanover in May, attended by representatives from all four zones, and elected Schumacher leader of the party. He came out strongly at this time against the dismemberment of Ger., and in favour of a free and democratic Ger. on a federal basis. In the Russian zone the large estates of Mecklenburg, Brandenburg, and Saxony were broken up, and land amounting to over 4,000,000 ac. was distributed to some 300,000 families of peasants, including refugees deported from Poland and Czechoslovakia. Administration in the three provs. and in Thuringia and W. Pomerania was carried out by representative Ger. govs. set up by the Soviet military authorities with executive, legislative, and judicial authority, while a central administration for the whole zone was created in Berlin. Elections for the prov. assemblies were held in 1946 with the Socialist Unity party in the majority throughout the zone. Municipal elections were held in all four zones in various stages throughout 1946—the first free elections since 1932. In the Brit., U.S.A., and Fr. zones the Christian Democrats proved the strongest party, with the Social Democrats a strong second. In the Russian zone the Socialist Unity party had the strongest vote. In all four zones together the Christian Democrats polled over 10,000,000 votes, and the Social Democrats over 7,000,000, while the Socialist Unity party counted 5,000,000 supporters in the Russian zone, and the Communists over 1,000,000 in the other three zones. In Berlin itself the Social Democrats won a victory in the face of strong Communist opposition.

Towards the end of 1946 the Brit. zonal administration fell more into line with the U.S.A. and Russian zones, in that four *Länder* were created, each with a measure of prov. autonomy under a constitution to be drawn up by the prov. gov. Coordination of the policies of the prov. govs. was the responsibility of a Ger. Zonal Advisory Council. In Dec. 1946 discussions were started between the United Kingdom and the U.S.A. towards an economic fusion of the Brit. and Amer. zones with the aim of achieving a self-sustaining economy. These zones were heavily subsidised by the occupying powers, and the deterioration of the food situation caused apathy and discontent among the pop. In Jan. the following year three joint executive agencies were set up to deal with food, agriculture, and transport, with a fourth advisory joint administration for finance, but fusion of the two zones was not at this stage carried further. The project, however, received greater impetus following the failure of the Council of Foreign Ministers at a conference in Moscow in March 1947 to reach agreement on any plan whereby Ger. could be governed as a single economic unit. By May negotiations between the Brit.

and US Govs led to an agreement which accomplished a full economic fusion of the two zones while maintaining the political independence of the Länder govts concerned. A Bi-zonal Economic Council was set up consisting of fifty four members selected by the govs of the Länder in proportion to the pop of each Land. A co-ordinating body known as the Executive Committee was also created, consisting of a representative of each Land govt. The committee's task was to make recommendations to the council, and to co-ordinate and supervise the ordinances issued by the Economic Council which acts, as it were, as an economic parliament. Finally, executive directors were appointed by the council and placed at the head of each of the five bi-zonal depts., to deal with food, agriculture, transport, finance, and manpower. These depts superseded the joint executive agencies created earlier in the year. These arrangements were welcomed by the Gers in the W zones as the first step towards a planned reconstruction of their country, and it was hoped that the two zones concerned would achieve a balanced economy, thus relieving the occupying powers of a considerable financial burden. Developments in the Russian zone were more radical. The occupying power continued the transfer of properties to so-called *Aktien Gesellschaften* to acquire Ger factories removed vast quantities of goods and equipment to Russia, and sought to tighten the hold of the one party regime. Living conditions in the Russian zone were bad and, according to Ger reports from that zone, worse than in the W, but shortages were aggravated by the hardest winter in living memory.

In London (Dec 1947) four power negotiations in the Council of Foreign Ministers broke down on the future of a politically and economically united G. The govs of Britain, France, and the U.S. therefore decided to carry out without Russia, the political and economic integration of their zones. G now became a pawn in the political conflict between the W world and Russia. Discussions between the three W Allies in which later the Benelux' (q.v.) countries joined—resulted in June (1948) in a six power agreement providing for international control of the Ruhr, G's representation in the European recovery programme fusion of the Anglo Amer zones and a federal system of govt for G. The Russians, in turn, with a declaration (June 23) condemning the plan to 'divide' G, proposing four joint control of the Ruhr and the setting up of a 'democratic govt for all G'. As a part of their plan to aid Ger recovery the W powers announced a drastic currency reform to apply to their zones but not to Berlin and on June 20 the Ruhmark was withdrawn and the new Deutschemark introduced. The Russians countered this move on the same day with an order forbidding all traffic between their zone and the W. Thus began the 'blockade of Berlin' and soon afterwards the Allies' measures to supply their sectors with

food and other goods through the 'air lift'.

The W. allies in June recommended that the Gers call together a parl assembly for W.G by Sept 1. The assembly was to work out a constitution by the end of the year and elect a govt by the spring of 1949. There was considerable doubt in the minds of Ger politicians, who feared that a govt in W.G would deepen or perpetuate the E.W. div of the country. But subsequently they decided to co-operate with the policy of the W powers, mainly because the sixteen European recovery nations had accepted W.G as a beneficiary under Marshall aid and this would give a chance of prosperity for G and the cutting down of the allied reparations demands. The W. Allies wanted a Ger govt in the W because they could not get one for the whole of G. They wanted Gers to administer their own affairs under indirect allied control, because they wanted to ease the burden on the taxpayers at home, they wanted the political and economic integration of W.G because it would be a good bargaining counter in their dealings with the Russians, and finally, they wanted an economically prosperous and politically stable G to play her part in the European recovery programme (see this ENCYCLOPEDIA, History).

Meanwhile the W. powers following the breakdown of the London conference, met in Nov (1948) on the question of the control of the Ruhr. Just previously the Brit and Amer military governors—Gens Robertson and Clay—issued identical laws for their two zones to the effect that the ultimate decision as to the ownership of the mines and steel works should be decided by a freely elected Ger Parliament, whether for all G or for W.G. Secondly, as a sort of earnest of Brit and Amer intentions, they decided that ownership of the mines now vested in the allied military governors, should be vested in Ger trustees subject to the trustees being appointed by and responsible to, the military governors and with very narrowly limited powers. In Dec the representatives of the six powers (Great Britain U.S.A., France and the 'Benelux' countries) announced their agreement on an international authority for the Ruhr to control its development and general economic direction. In other words G was told that sovereignty over the greatest concentration of coal, iron, and steel production in Europe was no longer hers alone but was to be shared with six other nations. Whether the Gers liked it or not, the first experiment was to be tried in a supranational control of a national group of heavy industries. It was part of a policy designed to make G. industrially strong but militarily harmless. This was the first of the last three great acts of will towards a defeated G which were intended to mark the end of the immediate post-war period. The other two acts were, first the effort to make the W. Gers set up a govt with an acceptable constitution and, second, the attempt to lay down in a written Statute

of Occupation what should be the relations between the occupying powers and a Ger Gov. Those three acts were, of course, connected; and one of the first tasks of the new Ger Gov. (when it was formed) would be to take its place in the new Ruhr International Authority—an authority in which Gers could be outvoted by twelve votes to three—this being a compromise between the views of six Allies with Amer views predominating. To the Fr it meant a new method of trying to make sure that G remained disarmed and did

mittee (the Humphreys Committee, composed of Amer industrialists) had been appointed (Oct 27, 1948) to discover what plants marked for dismantling would serve European recovery better by being left in G, but the three powers had as yet hardly begun to consider the committee's report. Again, until the Occupation Statute was completed, it was hardly possible to complete the constitution for W. G. Similarly, the fusion of the Fr zone with the other two W nations' zones, though long agreed 'in principle,' was still far from



BERLIN, 1948

A meeting of anti Communist parties outside the ruined Reichstag building in the British sector of the city

not dominate its neighbours by its industrial strength; to the Amers it meant a first step towards the co-operation of W. Europe into one economic system with G included; while to the Brit, it meant an element of each of these, combining with a chance of introducing into European recovery the kind of co-operative planning that should provide safeguards against cut throat competition in world markets.

By the end of Feb. (1949), however, progress in implementing the policy of the three W. powers was discouragingly slow. In principle, the Brit, Fr., and U.S. Govs. had been in agreement on the objects of their policy and on the steps necessary to attain them ever since the London conference of June 1948. But they had found it increasingly difficult to agree in practice. The Ruhr Authority and a Military Security Board had been estab., though neither was yet working. A com-

being accomplished. Still more serious, perhaps, was the delay over the Ger. constitution or basic law, though on Sept. 1 (1948) the Parl Council met at Bonn to begin the work of drafting a constitution. The council had then only the general guidance contained in the London Agreement, that it should fashion 'a federal form of government which adequately protects the rights of the respective states (or Lander) and which at the same time provides an adequate central authority and which guarantees the rights and freedom of the individual.' On reparations and economic policy the U.S. Gov took a much more lenient attitude than the Brit. and Fr. Govs.; on the constitution, the Fr. and U.S. Govs both wished to see a far more federal system, with far fewer powers for the central gov., than the Brit. There was always the difficulty, too, that the Fr. were by no

means convinced of the wisdom of establishing a Ger. Gov. at all and were, consequently, in no haste either to see it begun or to relinquish their hold on the Fr. zone of occupation. In March (1949) the Parl. Council at Bonn appointed a special commission to examine amendments to the draft constitution proposed by the three military governors. Criticism of these amendments of the military governors was varied but, in the main, reserved. Dr. Menzel, deputy leader of the Social Democrats, thought that the emphasis on Land sovereignty meant a retrogression, even from the Economic Council at Frankfurt. But the most outspoken criticism was that of the Christian Democratic leader, Jakob Kaiser, who strongly resented the allied decision to exclude Berlin from the federal republic of W. G. The chief protagonist of a political bridge from W. to E. through the Soviet zone and always an apostle of Ger. unity, he now thought all Berlin and even the Soviet zone should be included under the new constitution.

By April, however, the three W. powers had largely resolved their difficulties among themselves through the solidarity achieved by the conclusion of the N. Atlantic Treaty (*see EUROPE, History*), which was the corollary to the W. Union. The political effect of this treaty for strengthening the mutual defence of the W. nations from external aggression upon Russian opinion was soon manifested, for in the same month the gov. of the Soviet Union informed the U.S. Gov. that it was willing to raise the blockade of Berlin if a definite date were set for a Council of Foreign Ministers to discuss Ger. questions. It was, however, made clear by the W. powers that the holding of a council would not deflect the three govs. from their plans to establish a gov. for W. G. These plans were now easy of accomplishment by reason of the fact that the Parl. Council at Bonn had come to an agreement over the draft constitution. By May 20 the legislatures of some eight *Länder* had ratified the Bonn basic law by substantial majorities and the two-thirds majority required before promulgation was thus obtained.

In anticipation of the completion of the basic law, the govs. of the U.S.A., Great Britain, and France had drawn up in Washington (April 6-9) an agreed memorandum to govern the exercise of their powers and responsibilities in G. following the estab. of a Ger. federal republic. The Allies, who retained their supreme authority, reserved the right to take direct action themselves in certain limited fields set out in the Occupation Statute when the Ger. federal republic should have been estab. Military gov. as such will terminate and the functions of the allied authorities will be divided—control functions being exercised by a high commissioner and military functions by a com. andr.-in-chief. The three high commissioners together will constitute an allied high commission—one of whose chief duties will be the unanimous approval of amendments to the federal constitution proposed by the federal gov. Responsibility for the super-

vision of U.S. relief funds to Ger. economy will rest with the Economic Co-operation Administration (*see further under EUROPE, History*). The 'understanding' is that the Ger. federal republic should become a party to the convention for European economic co-operation and execute a bilateral agreement with the U.S. Gov. The memorandum states that a major objective of the three allied govs. is to encourage and facilitate the closest integration on a mutually beneficial basis of the Ger. people under a democratic federal state within the framework of the European association. According to an annex to the memorandum the three govs. agreed to enter into a trizonal fusion agreement prior to the coming into effect of the Occupation Statute. The representatives of the three occupying powers will make the necessary arrangements to establish tripartite control machinery for the W. zones of G., to become effective at the time of the estab. of a provisional Ger. gov. Though the Berlin blockade was lifted (May 12), the continuance by the Russians of various restrictions largely nullified the value of the removal. At the subsequent meeting of the foreign ministers' council it was found impossible to reach any agreement with Russia over the issue of Ger. economic unity. In all the circumstances it is not surprising that the Anglo-Amer. air-lift was not interrupted.

Art.—See GERMAN ART.

Language and Literature.—Anc. G., like other European nations in the years of their infancy, spoke a number of dialects, all of which grew out of the Aryan family of tongues. Most of these dialects may be affiliated to one of two branches, High Ger. and Low Ger. (Hoch Deutsch and Platt Deutsch), and both of these can be traced as far back as the seventh century. Besides these, evidence is afforded by the fourth-century Gothic trans. of the Bible, undertaken by Bishop Ulfila, of a dialect quite independent of either of the two groups mentioned above. To-day High Ger. dialects are split up into the Swabian, commonly spoken in Wurtemberg; the Alemannic, spoken in S. Baden, Alsace, and Ger. Switzerland; and the Bavarian, which is the everyday language in Bavaria, Upper and Lower Austria, Styria, Tyrol, and Salzburg. The so-called Middle Ger. dialects, the Franconian, Thuringian, Silesian, and Saxon really belong to the High Ger. stock. The Low Ger. branch, on the other hand, comprises Old Saxon and Lower Franconian. In the former dialect was written *Der Helleland*, which is a Christian epic of the ninth century, and the celebrated *Reincke Fos* (c. 1490) is in a dialect developing from Old Saxon. The latter is father to the modern Dutch and Flemish. The modern dialects, known as Frisian and Platt Deutsch, are relics of Low Ger. The names High and Low originally described the geographical areas where the different branches were spoken, that is, broadly speaking, S. and N. G. The disintegration of the empire into separate kingdoms offers an obvious explanation of the fact that rival dialects lingered so much longer

in G. than, say, in England. But from the Reformation period, when Luther translated the Bible into a language which was a composite of various forms of High Ger., the doom of the other branch, at least as far as literature was concerned, may be said to have been sealed.

The primitive Ger. peoples fed their natural love of literature on old legends, heroic sagas, and 'beast epics' (*Tierepos*), the atmosphere of which was invariably pagan and bloodthirsty. The virile and splendid animal satire of *Rünke Fuchs*, which fastened itself so firmly on the popular fancy, and which was retranslated into Ger. from the Fr., was probably compiled originally out of one of these 'beast epics.' As in England during the Norman period, the native tongue was under the Saxon emperors left entirely to the people, being supplanted at court by Lat., then the language of cultured social intercourse. But the fullness of medieval life soon inspired men to write of it in their vernacular. The ideas of chivalry, the pageantry and splendour of the courts, the spirit of faith, and also of adventure, both of which were quickened by the stirring episodes and E. glamour of the crusades, all combined to instil fresh vigour into the common peoples, with the result that in G. there sprang up the *Minnesänger* (Singers of Love), who correspond to the troubadours of France and the Welsh and Irish bards. During the thirteenth and fourteenth centuries these men roamed from castle to castle telling fragments of the great cycles of romance and singing little songs of love and passion. Many of these wandering poets were knights and men of courtly breeding such as Walther von der Vogelweide (c. 1170 c. 1230), the most famous of them all, and it was from their lips that the country-folk learnt of the deeds of the great Alexander or Charlemagne, or of the exploits of King Arthur and his Knights, or of the Sangraal, or of the Dan. hero Beowulf. The immortal *Aduengen* and *Gudrun* are a mine of national and heroic saga to which Wagner naturally turned when he dreamed of founding a national opera, and it is here that the epic and tragical grandeur of pagan folklore finds its noblest expressions. The names of a number of the minnesingers are still remembered with honour, among them Heinrich von Veldeke, Gottfried of Strasburg, Hartmann von Aue, and Wolfram von Eschenbach, all of whom were authors of court epics (*Tristan und Isolde*, *Der arme Hlinrich*, *Parsifal*, by the three last-named authors respectively). It is important to note that in the thirteenth century laws began to be couched in the native (Ger. instead of in Lat., as is clear from the two famous collections, *Sachsenspiegel* (1230) and *Schwäbenspiegel* (1270)). This displacement of Lat. is important, for the fact that the monks wrote a mass of scriptural paraphrase and religious poetry in the classical tongue seemed for the time being to stigmatise Ger. as unworthy of literary usage.

The fifteenth century was fruitful in all

kinds of truly popular literature. Thus passion plays and mysteries roused dramatic interest up and down the country and familiarised men in a most delightful manner with the leading figures of biblical story; *Volkslieder*, or national ballads, appealed to the inborn sentiments of patriotism; prose was for the first time handled with success in the romantic and wonder-telling *Volksbücher*, such as *Tyll Kulenspiegel*, *Dr. Faust*, and *Die Schildbürger*, whilst the degeneracy of the Catholic Church offered a rich field both for mocking satires and serious theological discussions. Moreover this and the following century were the age of the craftsmen-poets or *Meistersänger*, the best known of whom is Hans Sachs (1494-1578), the cobbler of Nuremberg and the author of the metrical *Schwänke* and *Fastnachtsspiele*. These men were already associated into guilds for their trade, and conceived the quaint notion of founding also guilds of poetry, which should draw up a strict code of rules for the composition of correct and model verse. The greatest benefactor to literature was, however, Martin Luther. His Ger. Bible (1522-34) has already been referred to, but when it is remembered how, with amazing rapidity, this book found its way even to the most insignificant tns. and solitary households, and further how eagerly it was read and re-read, it will be admitted that too much stress cannot be laid on its position as a milestone along the path of Ger. literary advancement. Luther was also a great hymn writer, and his collection of sacred songs is not the least of his priceless legacies.

On top of the Reformation came the Thirty Years war, which quenched the springs of literature just as it sapped the life-blood from all things that were already thriving and promising still greater good to come.

From 1621 to 1748 has been called the Age of Imitation. Real literary talent was scarce and men who had leanings towards letters unfortunately believed that the art of writing poetry could be taught. As in England during the years following the Restoration, the Fr. classicists, Racine, Corneille, and Molière, became the models for all youthful writers of inspiration. At the many courts the Fr. manners and language were zealously cultivated, and the people at large lost sight of their native tales and ballads. To such an extent had the Ger. dialects become adulterated with the steady infiltration of foreign words, that a number of language-reforming societies sprang up everywhere on the lines of the 'Fruit-bearing League' founded in Weimar (1617). To this somewhat lifeless epoch belong the Silesian poets who are usually divided into two schools. Of the first the chief ornament was the precise and servile Martin Opitz (1597-1639), whilst Hoffmann von Hoffmannswaldau (1618-79) is typical of the second. It was the representatives of this latter school whose attempts to infuse sweetness and sentiment into their poems have brought

down upon them the unflattering description of 'turgid' and 'bombastic.' Romances and windy tales of fiction and adventure steadily gained ground; many were the Ger. versions of *Robinson Crusoe*, and the stormy years of the First World War were reflected in numerous *Tales of Ups and Downs*, by far the liveliest and most absorbing of which was the 'Simplissimus' of Grimmelshausen (*d.* 1676). The healthy rivalry between the Leipzig and Zurich schools in the eighteenth century contributed much towards clearing away the pedantry and artifice which seemed likely to submerge any real stuff that was written. Thanks to the Swiss leaders, Bodmer and Breitinger, imagination and emotion reappeared in poetry, whilst Gottsched (1705-66), the foremost of the Leipzig men of letters, helped by his *Critical Art of Poetry* to wean men's tastes away from the Fr. to which they



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had so long been blindly fettered. It remains to note the two great writers of Protestant hymns after Luther, namely, Gerhardt (1607-76) and Gellert (1715-69), for it was through them chiefly that literature diffused itself among the common people. Gellert's *Fables* also, with their arresting simplicity, shared in this work of popular education.

The second classical period opens in 1748, and the great movement towards literary regeneration, which may be said to culminate in Goethe and Schiller, was nobly heralded by Klopstock (1721-1803), Lessing (1729-81), Herder (1744-1802), and Wieland (1733-1813). Klopstock's epic *Messiah* inspired as it was by *Paradise Lost*, is the fullest and finest expression of the unstinted admiration which Ger. felt for the Eng. masterpiece, and is further remarkable for the sublimity of many of its lines and for its tender and devout religious spirit which recalls the greatness of the old reformers. In his

Laoçoön and other critical works, Lessing taught men the difference between the pseudo-classicism of the Fr. and the true Hellenic spirit as it is revealed to us in Gk. sculpture and drama. He was, moreover, brave enough to declare the superiority of the romantic Shakespeare over the slavish followers of the so called Aristotelian unities, and in his own plays strove to reproduce the merits of Eng. rather than of Fr. drama. The enthusiastic reception accorded to his comedy *Minna von Barnhelm* and his great tragedy *Nathan der Weise*, which may be said to have estab. the fitness of iambic blank verse as the vehicle for dramatic work, showed that like all true poets Lessing, was only anticipating what was a popular tendency—a wider and a happier freedom in literature as in other fields of human endeavour. To pass away from Lessing who is justly esteemed a pioneer in the rationalistic movement of his age, it is necessary to note the high niches which the sensuous and witty romances of Wieland will ever occupy in the hist. of Ger. prose. But the command of this writer over all that is graceful and fantastic, his flowing verse, and the flexibility of his language are best appreciated in his celebrated fairy epic *Oberon* (1780). From an historical point of view the great merit of Herder was his deep love of all poetry that was truly national. Thus he gathered together the *Volkslieder* of many nations, studied and wrote about primitive Heb. poetry, and marvelled at the simplicity of the spurious *Ossian*. His was an essentially receptive nature, but he was born with a keen sense of the beautiful and a delight in humanity at large, and these personal qualities lend fascination to his poems. In that he was an apostle of 'Light, Love, (and) Life'—the three words which were graven on his tomb—he may be regarded as the source of inspiration for all that was noble in the *Sturm und Drang* movement, which now assailed literature, but in a broader sense this movement must be regarded as part of that unrest and desire of change which in France was manifested in the great revolution, and which in England is represented in literature by the 'Lyrical Ballads' and other productions of the Romantic school.

The term *Sturm und Drang* (Storm and stress) was taken from a play of Klinger which bore this title. The intentions of the leading exponents, Klinger (1752-1831) and Mahler Müller (1749-1825), were undoubtedly good: they wished to fling away the shackles of art and to give free rein to all their enthusiasm and poetic ideals. Unfortunately, like the dramatist who followed Shakespeare, they were none of them gifted with outstanding literary talents, so that all their plays and novels are marred by extravagances of passion and hideous caricature, whilst their ideals of sublime action and character development, uncurbed as they were by any of the saving restrictions of art and moderation, resulted in pure licence. Moreover, in their efforts to substitute the

cult of reason for morality they succeeded only in shattering the poetic gifts they had in lives of dissipation and excess. To realise the full force of this period of temporary madness it is only necessary to recall the fact that Goethe's *Götz von Berlichingen* and his *Die Leiden des jungen Werthers*, in which literature may have paid its highest tribute to sentimentalism, were both written under its influence.

Goethe (1749-1832), of course, stands aloof from the normal channels of literary development together with the other Shakespeares and Dantes whom the world at intervals of centuries begets. His *Faust* belongs to universal literature. It has been called 'mystical impersonation of a transition age,' where the ancient faith had *d.* and science was still a weak prop on which to lean, where, in short, the individual was, whichever way he turned, dependent solely on his own good and evil instincts. Whether this be so or not, *Faust* is certainly the summary of its author's mental life, and may thus be said to mirror forth the struggles between the sensual and the spiritual, between faith and reason, between the noble and the base—struggles which are eternally raging in every human breast. But what is of peculiar interest touching Goethe from a psychological point of view, and what perhaps may in some senses be regarded as typical of the modern as well as of the Ger. nationality, is that not only was he endowed with the highest creative genius, but he had himself taken the utmost pains to acquire the most profound and all-embracing culture. His *Iphigenie* (prose version 1779, verse version 1787), *Egmont* (1788), and *Torquato Tasso* (1790) rank with *Wallenstein* (1799), *Marius Stuart* (1800), *Du Juengfrau von Orleans* (1801), and *Wilhelm Tell* (1804), which are four of the finest dramatic productions of Schiller (1759-1805), his friend and almost rival. These two stand easily at the top of Ger. dramatists; and in the breadth of their outlook and of their historic sense in their passion for all forms of freedom and the vividness and variety of their portraiture, and above all in their grasp of the essence of tragedy and dramatic situation, challenge and almost deserve comparison with Shakespeare. Moreover both Goethe and Schiller outgrew the fevers of the *Sturm und Drang* period, and the former especially discovered the secret of that harmony which exists between the wonderful calm and self-restraint of the Hellenic spirit on the one hand and on the other the warmth, colour, and emotional fullness of the Romantic.

It is impossible to tie either Goethe or Schiller down to any one school or line of thought, and the same is true of the fertile Jean Paul Richter (1763-1825), who stands quite apart from the contemporary Romantic phase. In his lifetime his novels were even more welcomed and applauded than Schiller's or Goethe's works, and especially those classified as humorous, the first of which was *The Invisible Box*. All his books are remarkable for their fund of wit and wealth of

exuberant fancies; tenderest sentiments are hedged around with the most pungent satire, whilst not a few may be described as 'a hedge-podge of the loveliest thoughts and the wildest absurdities.'

The aims of the Romantic school were not unlike those of Wordsworth and Coleridge and their successors in England. Novalis (1772-1801) was a precursor of this school, but the 'theoretic basis of Romanticism' was estab. by the brothers Schlegel (August Wilhelm, 1767-1845, and Friedrich, 1772-1829). These men and their followers widened the province of poetry so as to include music and philosophy and all the other elements of intellectual life; they were opposed to the shallow utilitarianism and unlovely rationalistic theories of their age, and



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turned back for their inspiration into the medieval days of knights and pageants, of miracles and mysticism. Mentally too they travelled further afield into the unexplored riches of the E. and away back into the world of folklore and weird pagan superstitions. It was a time of admirable trans., such as the elder Schlegel's *Shakespeare* (1797-1810), and it was also a time when Ger. philology and medieval literature were first seriously studied, for both the Grimms came under the influence of Romanticism.

In time the Romantic school began to lose its hold, and after the famous July Revolution of 1830 'young G.' occupied the literary field. Writers of this period no longer form a definite school, but they all reflect in their works the period of uncertainty and transition through which Europe was then passing. Furthermore, all manner of industrial, social, and economic problems begin to permeate literature, and it is customary also to associate together young G. and

the predominance of the Hegelian philosophy. The leading men of letters at this time were Laube (1806-84), the author of social works of fiction; Börne (1786-1837), whose *Briefe aus Paris* are of vital importance in the progress of Ger. prose, and Heinrich Heine (1797-1856). The last-named was the greatest of them all. Undoubtedly he was a victim of the transitional age into which he was born and this explains how he could with justice be called 'the mocking-bird of the literary grove.' Yet in spite of his negative bias and unbelief his poetry will live; for to him was given with Schiller and Goethe that purely inborn gift of lyrical outpouring from this time forward his nature gradually grew more and more comprehensive, so that now it includes all branches of knowledge and every field of human interest. It is difficult any longer to trace broad tendencies, for the whole trend of modern life in G., as elsewhere, has been towards a still greater complexity, and time only will suffice to unravel the main threads which now seem so entangled. But no sketch of Ger. literature can be attempted without mention of the number and prominence of the philosophers. The first mark was Leibnitz (1646-1716), who wrote in Fr. and Lat., and eighty years later came Kant (1724-1803), the author of the *Critique of Pure Reason*; whilst other thinkers of world wide repute are Fichte (1771-1819), Schopenhauer (1788-1860), and Hegel (1770-1831). The latest and one of the most original of the great philosophical writers is Nietzsche (1844-1900), whose doctrines of superman and the justice of self-assertion, etc., which are often summed up as individualism, have had, and are still having, a remarkable influence over the intellectual development, not only of his own countrymen, but of a great number of growing men and women in all parts of the world. His 'superman' doctrine had an oblique bearing on the Aryan propaganda of the Nazis and the racial 'theory' in Hitler's *Mein Kampf*, as well as the teaching of Heinrich Brüning (q.v.), owe much to it. It is not too much to say that in the regions of higher philosophy G. stands quite without compare.

From 1850 to 1870 the novel engrossed most of the best writers. This form of literature became the favourite vehicle of expression all over Europe, probably because it is a classic that the author may freely bend it to his will and embody in it the whole sphere of his culture and experience. Thus there were many social novels on the basis of Gutzkow's *Küller vom Geiste*, there were political and anti-slavery novels, there were stories which dealt with the peasants such as Auerbach's *Schwarzwalder* (1813-54), and there were tales in the form of biography, such as Keller's splendid *Der grüne Heinrich* (1855). For some time authors devoted themselves to realistic fiction, but *Buddenbrooks* (1902) by Thomas Mann and the work of the women writers, Clara Viebig, Helene Bohm, and Gabriele Renter, deal rather with problems of emotion and

psychology which seem better suited to the Teutonic temperament.

In dramatic literature the two outstanding writers in the nineteenth century were F. Grillparzer (1791-1872), an Austrian, and Friedrich Hebbel (1813-63). In the period immediately preceding the First World War Hauptmann (q.v.) and Sudermann (q.v.) held the stage with their plays, which are real products of the time. The gloomily realistic *Weber* (1892) is the best known of Hauptmann's works, though he has also produced quite notable romantic work in such plays as *Die versunkene Glocke* and *Hannes Himmelfahrt*.

Ger. literature is notable too for its wealth of scientific and critical writers. Whether the reader turn to philosophy, physiology, medicine, the natural sciences, archaeology, hist., economics, jurisprudence, astronomy, mathematics, or theology, he will find that a number of the most reliable, erudite, and compendious treatises have been written by Gers. Thus Mommsen (1817-1903) has left behind him a monumental work on Roman history, Humboldt (1767-1853) by his *Travels* and *Cosmos*, etc., gave an extraordinary stimulus to scientific inquiry; Kepler (1571-1630) discovered certain laws of primal importance in astronomy, Euler (1707-83) ranks as one of the great mathematicians, and in the last century Virchow (eminently distinguished himself in pathology, and Helmholtz in the newly-conquered dominion of physiological physics). Bluntschli (q.v.) and Pufendorf (q.v.) are among the great writers on jurisprudence, von Hartack (q.v.) is a leading theologian, Schwabmuth (q.v.) ranks high among archaeologists, Nauck, H. von Arnim and Wilamowitz-Moellendorff are among the numerous distinguished writers on G. literature, the last named indeed laid the foundation for modern criticism in that sphere.

A short list of other individual writers of eminence is herewith appended that the reader may refer to their biographies for further information. Gottfried of Straubburg (d. 1220), Meister Eckhart (c. 1260-1327), Johann Tauler (c. 1300-61), Sebastian Brandt, the satirist (1458-1521); Jakob Ayrer, sixteenth century dramatist, Ulrich von Hutten (1488-1523) and Huldreich Zwingli (1484-1531), Protestant writers contemporary with Luther, the Catholic Johann Schäffer (*Angelus Silesius*, 1621-77), Sebastian Franck (1499-1542), and Paul Gorhardt (1607-76), all famous hymn writers, Jakob Bohme (1575-1624) and Johann Venit (1555-1621), two mystical religious writers, the monkish Abraham a Sancta Clara (1644-1709) and Johann Bischoff (c. 1550-90), two leading satiric writers of succeeding centuries, two Silesian authors, Friedrich von Logan (1604-55), the epigrammatist, and Andreas Gryphius (1616-64), the dramatist Winkelmann (1717-68), the writer on aesthetics, and Johann Zimmermann (1728-95), author of *On Solitude*; Voss (1751-1826), the light of the *Göttinger Dichterbund* and his associates Gottlieb Bürger (1747-91), and the two Counts Stolberg, August Kotzebue (1761-

1846), the author of lively comedies, and Johann Tieck (1773–1853), a leading Romanticist; Heinrich von Kleist (1777–1811), the first of Prussia's dramatic writers; Ludwig Uhland (1787–1862), the chief of the Swabian school; Karl Gutzkow (1811–78), a member of Young G.; Wilhelm Hauff (1802–27), K. Spindler (1796–1855), and Wilhelm Haring (1789–1871), who wrote novels after the manner of Scott; Franz Grillparzer (1791–1872), the finest Austrian dramatist; E. Gelbel (1815–84), the lyrict; the novelist Gottfried Keller (1819–90); Ferdinand Lassalle (1825–64) and Karl Marx, two of the best intellectual writers on social democracy; three historians of note, I. von Ranke (1795–1886), II. von Sybel (1817–95), and II. von Treitschke (1834–96); the Austrian Anzengruber (1839–89), who depicted on the stage the life of his native province; the favourite humorist and fiction writer, Fritz Reuter (1810–74), who wrote *In Platt Deutsch*; F. Hebbel (1813–63), the dramatist, author of *Maria Magdalene* and *Die Nibelungen*; Gustav Freytag (1816–93), novelist, author of *Soll und Haben*; and O. J. Bierbaum (1863–1910), the composer of popular lyrics.

Twentieth-century German literature.—Before the First World War Ger. literature experienced comparative calm. Important writers of this period were the dramatists Gerhart Hauptmann (1862–1913), his contemporary Sudermann (1857–1928), and Frank Wedekind (1841–1918), whose influence over European literature is still felt, and the poets Dehmel, Rilke, and Stefan George. The main influences of this period were naturalism and its opposite 'art for art's sake', Hauptmann leading the former school and Stefan George the latter. The Impressionist novel, derived from the naturalists with, however, a greater emphasis on character, particularly as manifested in the artistic temperament. Outstanding among the Impressionist novelists are Emil Strauss (b. 1866), Hermann Hesse (b. 1877), Jacob Wassermann (1873–1931), and particularly the brothers Heinrich and Thomas Mann, the latter especially notable figure in modern world literature. Interest was shown by the poets in machinery and the subjection of physical resources to the use of civilised man. Towards the end of the First World War war-weariness and despair, accentuated in G. by the revolution (1918), had its effect on the younger writers. Johannes Becker in his works violently opposed war, and the chaotic state of life was expressed generally in literature by expressionism (q.v.), a movement borrowed from painting in a spirit of almost ecstatic mysticism. Some writers, such as Arnold T. Wegner, turned from the cities and roar of machines to find satisfaction and peace on the land and in the countryside. Labourer poets of the war were Karl Broger, Gerrit Engelke, Max Barthol, and Heinrich Lersch. War novels were written by Remarque and others, and the state of G. at home was shown in the novels of Clara Viebig; while one of the greatest war books is *Opfergang*, written by Fritz von Unruh in the trenches

In 1916. Post-war G. was mirrored in Ernst Toller's tragedy *Hinkemann*, and Reinhard Goering in the drama *Seeschlacht* represents the attitude of the navy in the First World War. Expressionist drama, dealing with types and making use of allegory, was written by Walter Hesenclever, Fritz von Unruh, Franz Werfel, Arnolt Bronnen, Ernst Toller (e.g. *Seren Plays*, Eng. trans. 1935), Georg Kaiser, and Anton Wildgans. Satirists of the twentieth century are the novelist Heinrich Mann and the dramatist Carl Sternheim. The Expressionist writers were as a rule Socialists, Kurt Eisner (q.v.), the poet, being assassinated, while another tendency revealed in their work was their changed attitude towards women, relationship between men and women being intellectual rather than emotional. In 1922 Expressionism subdivided and painters and writers, tired of dealing with types and symbols, sought new forms. Some writers, such as von Unruh, made use of historical subjects, while others have shown a renewed interest in the Catholic religion. Another interesting tendency was the marked manifestation of Jewish temperament—Wassermann, already mentioned, Feuchtwanger, Stefan Zweig, Bruno Frank, and Emil Ludwig. Scientific writers include E. Schrödinger (*Science and the Human Temperament*) and Einstein, one of whose important works, apart from those on relativity, is *The World as I see it*. Among poets Rilke gained in stature until his death in 1926, and is now recognised as one of the major poets of the twentieth century. Thomas Mann's reputation also extended beyond G. with the pub. in 1924 of his great symbolical novel *Der Zauberberg* (trans. into Eng. as *The Magic Mountain*), and later under the Nazi regime and during the Second World War he became a rallying point for that Ger. culture which the Nazis did so much to suppress. Even under the Nazis, however, literature managed to survive persecution and dictation principally by devotion to historical and biographical work in which hostility to the regime could be disguised. Alfred von Martin's *Burckhardt und Nietzsche* (1941) and Matthias Telzer's *Jubius Caesar* (1941) are examples. The Ger. tradition of classical scholarship was kept alive by notable eds. of G.K. and Rom. authors. Free thought was also encouraged by eds. and trans. of the great Fr. and Eng. writers, notably Prof. Schlickin's ed. of *Hamlet*.

Music. Few would gainsay the assertion that G. is pre-eminent in music, though some would perhaps prefer that the word music was qualified by 'modern', in recognition of the early supremacy of Italy in opera and in sacred music. It is at least certain that it is to G. alone that the world owes the 'magnificent development of instrumental music.' The Germans point to great musicians who are representative of every school, and who excel in every branch of musical activity. In some way the decentralisation of the Ger. states and the multiplicity of Ger.

courts were favourable to the cultivation of the art. It is true that the princes and dukes were often generous patrons, whilst all of them had their court musicians and held concerts from time to time, which offered a suitable occasion for the performance of new works. Music moreover was always associated with the religious life of the people. Thus not only in the towns, but even in the smaller villages, there were chapel-masters (*Kapellmeister*) whose business it was to train the choir and to conduct the orchestra, which played so great a part in the social life of the people. In every case, too, like Dresden and Leipzig, there were opera houses which offered scope for the labours of a musician whether player or composer, and it should not be forgotten that public subsidies were again and again voted for the upkeep of these centres of musical culture.

Sebastian Bach, the 'father of modern music' (1685-1750), gave a splendid scientific foundation to his art, and by his improvement of the existing forms of composition made possible the glorious work of Haydn and Mozart. It was through these men, his successors (1733-1809 and 1756-91), that the world first learnt that in the modest unassuming Bach it had lost truly a master spirit, for they were never weary of confessing their indebtedness for all that he had taught, and especially for the lessons learnt from his immortal *Preludes and Fugues*. Under Haydn and Mozart the sonata and the symphony — probably the greatest vehicles for musical expression ever invented — grew apace, and posterity is still as delighted as ever with the freshness, the melodious wealth, the grace, and the dignity of their many masterpieces. Yet Haydn and Mozart were but stepping-stones to Beethoven (1770-1827), who stands in solitary grandeur — solitary save for the companionship of such men as Raphael, Tieck, and Shakespeare. For he found the secret of expressing in sound the profoundest thought and the loftiest spiritual yearnings of which mankind is capable. Whether his piano-forte sonatas, his opera *Fidelio*, or his oratorio *The Mount of Olives* be considered, the same prodigality of fine conceptions, the same beauty, and the same extraordinary power make themselves felt, whilst his incomparably glorious symphonies (nine in number) are still the example and at the same time the despair of every orchestral composer of ambition.

Later German composers are Schubert (1797-1869), the exquisitely song-writer; and the creator of the *Unfinished Symphony*; Schumann (1810-56), the leader of the Romantic school, who found relief for the unrest of his fiery spirit in his brilliant and imaginative pianoforte pieces; and Richard Wagner (1813-83). Before Wagner's time opera (and oratorio) had already engaged the attention of Mozart (*Le Nozze di Figaro*), Handel (1684-1759), Gluck (1716-87), the author of *Orpheus and Eurydice* and *Iphigenia in Tauris*, and Mendelssohn (1809-47), but the new composer came forward with a host of

revolutionary ideas which were the foundation of the 'Music of the Future.' To Wagner the resources of his art were boundless. He believed that only by the marriage of music with the sister arts, painting and poetry, could all the cravings and all the greatness of the human soul find adequate expression. Thus his operas were conceived on a titanic scale; in them there is nothing of the trivial sentimentalities of the old school, and what is of more vital importance, the function of the orchestra is no longer merely to accompany the singer, but to suggest moods, phases, and conceptions which are inexpressible in words. Thus in the vast cathedral-like structures which he built up in *Parzival*, *Lohengrin*, and *Tannhäuser* the orchestra forms an integral part, without which the whole fabric would collapse. In his lifetime Wagner was the victim of ridicule, but the performances of *Die Walküre*, *Siegfried*, etc., were the dawn of a new and noble epoch in the annals not only of Germany, but of European music. There are a number of late nineteenth- and twentieth-century writers of opera who have imitated Wagner: Peter Cornelius, Carl Gramann, Eugène D'Albert, Alexander Ritter, August Bungert, Wilhelm Knezl, Felix Weingartner, Siegfried Wagner, and Engelbert Humperdinck. These men are imitators, but an exception is Carl Goldmark. Germany in the twentieth century took the lead in instrumental music. Johann Strauß (1823-82) forged the link between the classic school and that of Liszt. Felix Daeusek, a virile composer, Max Bruch, Joseph Rheinberger, Heinrich Hollmann, Johann Huber, Frederick Gernsheim, Heinrich Herzberg, Miskowski, Xaver Scharwenka, and Sholtz are all late nineteenth-century composers of the newer instrumental music, while three composers, Carl Reinecke, Solomon Jadassohn, and Frederick Helfé, are followers of the classic tradition. Johannes Brahms (1833-97) startled the world by outstripping even Wagner with his indifference to old forms and canons, but his title to the highest musical honours is assured, while other composers who have written advanced instrumental music are Anton Bruckner (1824-96) and Richard Strauss (b. 1864). Strauss is the composer of the operas *Salomé*, *Electra*, *Rosenkavalier*, and followers of Strauss who may be named are Gustav Mahler, Felix Weingartner, and Hugo Wolf, who is a lyric artist of importance. Schönberg, a skilled technician, achieved European repute with his exploitation of new forms. Germany also possesses many important musicians, singers, and directors, and the writings of Kiesecker and others have advanced the history and aesthetics of music. Under the Nazi regime the musical life of the country was controlled by the Nazi *Kulturpolitik*, and the racial laws were rigidly applied to composers and musicians. The works of Jewish composers were banned, and composers such as Schönberg, Ernst Krenek, Kurt Weill, and Ernst Toch went into exile. The loss of first-rate performers, such as Schnabel, was

even more serious. Of the modern composers favoured by the Nazis mention may be made of Carl Orff, Werner Egk, and Rudolf Wagner-Regeny. With the end of the war in 1945 the musical life of the country was fostered by the occupying authorities, and among composers Paul Hindemith, whose popularity the Nazis had never been able wholly to subdue, came into his own as the leading German composer of his time.

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Germination, resumption of development of the seedling from the embryo

contained in the seed, in consequence of exposure to the necessary conditions of moisture, warmth, etc. The radicle, or young root, is the first to make its appearance, and begins to grow vertically downwards; the plumule, or young shoot, then begins to grow upwards, while the cotyledons take an approximately horizontal position.

Germiston, third largest tn. in the Transvaal, S. Africa, 9 m. from Johannesburg. It is the centre of the world's largest gold-producing area, having developed rapidly since 1886. After a period of depression about 1916, the introduction of new labour conditions and more scientific methods, and the reduction of overhead charges, renewed the prosperity of the tn. Engineering and other enterprises, including the Victoria Falls Power Company and the Modderfontein dynamite factory, were estab. to serve the needs of the gold-mining industry. In the nearby regions many small farms have been developed. The tn. is becoming popular as a holiday resort. There is an airport adjoining the township of Lambton, and the tn. is an important railway junction, with large railway workshops. Industrial sites are sold by the municipality at low prices, with railways, electricity, and water supplied. Pop. 102,100, comprising about 37,000 Europeans, about 62,500 natives, and about 2500 Indians.

Gérôme, Jean Loon (1824-1904), Fr. painter, b. at Vesoul. In 1841 he became a pupil of Paul Delaroche. In 1817 his 'Cock-fight' was exhibited. In 1855 'Le Siècle d'Auguste et la naissance de Jésus-Christ' placed him among the leading Fr. painters. The state purchased it, and bestowed upon him the Cross of the Legion of Honour. The 'Duel' of 1857 increased his reputation, and the 'Gladiators' (1859) was looked upon as his masterpiece. Among his oriental studies are 'Turkish Prisoner,' 'Prayer,' and 'Slave Market.' He excelled also in historical subjects, 'Louis XIV.' and 'Moliero' and 'The Death of Marshal Ney' being famous examples in this class.

Gerome, see GIARDMER.

Gerona: 1. Prov. in the N.E. of Spain, bounded on the N. by France, on the E. by the Mediterranean Sea, on the W. by Barcelona, and on the S. by the Mediterranean and Barcelona. It is important for its fisheries and fish-curing, as well as for its cork industry. There are also mineral springs in the prov., and its talines produce coal, copper, lead, and iron. It also manufactures linen, cotton, paper, cloth, and leather, and has hydraulic cement and other works. Its most important port is Portbou, and its area is 2264 sq. m. Pop. 320,300. 2. Fortified tn. in Spain, cap. of the above prov., about 53 m. N.E. of Barcelona. It is famous for its fifteenth-century cathedral and its siege at the hands of the Fr. in 1509. It is also the seat of a bishop. Pop. 17,600.

Gerry, Elbridge (1744-1814), Amer. statesman, b. in Massachusetts; graduated at Harvard in 1762. From 1774 to 1775 he was a member of the Massachusetts

Prov. Congress; a member of the Continental Congress (1776-81), and was a great advocate of the Declaration of Independence. From 1810 to 1812 he was governor of Massachusetts. His administration was marked by the enactment of a law by which the state was divided into new senatorial districts, which gave an unfair advantage to the party in power. From this has arisen the term gerrymander. In 1812 he was elected vice-president of the U.S.A., and was an ardent advocate of war with Great Britain. See J. T. Austin, *Life of Ellbridge Gerry*, 1828-29.

Gers, dept. in the S.W. of France, formed from various dists. of Gascony. Its prin. rivs. are the Save, the Gimone, the Gers, and the Bayse, and chains of hills run from N. to S. of the dept. The prin. cereals are wheat and oats, but the vine occupies more than 15 per cent of the surface, the average production being more than half that of France generally. Pop. 190,400.

Gershwin, George (1898-1937), Jewish-American composer: b. Sept. 26 at Brooklyn, New York; son of Morris G. He studied the piano under Charles Hambitzer; harmony under Edward Kilenyi and Rubin Goldmark. Composed musical comedy and orchestral works, *Let 'er Go, Lucy!* (1919); *Our Nell* (1923); *Lady, Be Good!* (1924); *Rhapsody in Blue* (1921); *Tell Me More* (1925); *Of Thee I Sing* (Pulitzer prize), 1932; and *Porgy and Bess* (1935).

Gerson, Jean Charlier de (1363-1429). Fr. scholar and divine, b. at the vill. of Gerson, in the dept. of Ardennes. He studied at the college of Navarre, Paris. In 1395 he was elected chancellor of the univ. of Paris and made a canon of Notre Dame. His chief work was his endeavour to abolish the papal schism at the councils of Pisa and Constance, also fighting hard against the exiles in the church. At least implicitly he held the council to be above the pope. After the council of Constance G. had to leave France owing to the enmity of the duke of Burgundy, and spent some time at Rattenberg in Tyrol. Here he wrote his famous book, *De consolatione theologiae*. On his return to France he retired into a monastery at Lyons, and devoted the rest of his life to teaching and study. The *Imitation of Christ* has been wrongly attributed to him. See monographs by J. B. Schwab, 1858; H. Daeremon, 1931; and A. Combes, 1910.

Gerson, John, see under KEMPIS, THOMAS A.

Gersonides, or Levi ben Gershon (1288-1344). Fr.-Jewish philosopher, mathematician, and physician; b. at Bagnols-sur-Cèze in the co. of Orange. Sometimes called Raibaghi, that being a vocalisation of the initials of Rabenu Levi ben Gershon. He came of a family of scholars, but the identity of his father is in dispute. His prin. work is *Mishnat HaDorot* (Wars of the Lord); a treatise on immortality, prophecy, omniscience, providence, the celestial spheres, and the eternity of matter. He followed Aristotle, being the first Jew that dared, in so doing, to join issue with Heb. theology. He d. at Perpignan.

Gervase, Falls of, on the Sharavati R., in Bombay, are considered the finest in India. The riv. divides in its descent into four cascades, and the cliff over which it falls is 830 ft. high.

Gerstacker, Friedrich (1816-72), Ger. writer and traveller, b. at Hamburg. For some years he lived an errant life in America, of which he pub. an account on his return to Germany. Later he travelled extensively in both America and Africa (1850-68). His narrative descriptions of his travels, written in vivid style, have enjoyed considerable popularity. He also wrote many novels, the plots of which were founded on his experiences.

Gerstenberg, Heinrich Wilhelm von (1737-1823), Ger. poet and critic, b. at Tondern, Schleswig. He studied at Altona and Jena, entered the Dan. Army, and served in the Russian campaign of 1762. He left the army for the civil service, but resigned his appointment in 1812. He did good service to Ger. literature by his *Erträge über Merkwürdigkeiten der Literatur* (1766-70), as well as by his tragedy, *Ugolino* (1768), which was one of the prin. forerunners of the classical period of modern Ger. literature. See A. M. Wagner, *H. W. von Gerstenberg*, 1920.

Gertrude (d. 1143), daughter of Emperor Lothair II. (q.v.). She married Henry the Proud, of Bavaria (1127) and was mother of Henry the Lion, of Bavaria (q.v.).

Gertrude, Saint (c. 1256-1303), Ger. mystical writer who lived in the convent at Helta, near Eisleben. She is sometimes confused with the abbess of the same name, but Ledos's book, *Sainte Gertrude* (1901), throws light upon this subject. A book entitled *Exercises of St. Gertrude* is famous in mystic theology; it was trans. into Eng. in 1863. She anticipated the 'modern' Rom. Catholic devotion to the Sacred Heart of Jesus.

Gervase of Canterbury, Eng. monk who flourished during the second half of the twelfth century. He was an eye-witness of the burning of Canterbury Cathedral and wrote *Tractatus de combustione et reparacione Dunelmensis ecclesiae* (1184). All his books are written in Lat., the chief of which are *Narrative of the Dissensions between Archbishop Baldwin and the Monks of Canterbury: a History of the Archbishops of Canterbury, to the accession of Hubert in 1193* and *A Chronicle of the Reigns of Stephen, Henry II., and Richard Cur-de-Lion*. His *Mapa Mundi*, a topographical account of England, survives in Ms. See W. Stubbs (editor), *Historical Works*, 1879-80.

Gervase of Tilbury (d. c. 1235), Eng. historical writer, said to have been a native of Tilbury. Before 1177 he was a student of law at Bologna, and witnessed the meeting of the Emperor Frederic I. and Pope Alexander III. at Venice. He was first employed by Henry II., for whom he wrote a best-book, and later entered the service of William of Champagne, cardinal archbishop of Rheims. About 1190 he was with William II. of Sicily, who gave him a country house at Nola, and in 1198 entered the service of the Emperor

Otho IV., who made him marshal of the kingdom of Arles, and married him to an heiress. It was to amuse the emperor that he wrote his best-known book, *Otia Imperialia*, which contains an historical geography of the world as well as a good deal of legendary matter. The *Otia Imperialia* is printed entire in Leibnitz's *Scriptores rerum Brunnsvicernstium*.

Gervex, Henri (1852-1929), Fr. painter, b. in Paris. He first devoted himself to the painting of mythological subjects and the painting of the nude, but afterwards took up the study of modern life with great success. He executed sev. important official paintings, for instance 'The Distribution of Awards' (1889) at the Palais de l'Industrie and the 'Coronation of Nicolas II.' (1896), besides paintings for the decoration of public buildings. Other pictures of his are 'Satyrs playing with a Bacchante,' 'Members of the Jury of the Salon,' 'Communion at Trinity Church,' 'Return from the Ball,' 'Dr. Péan at the Salpêtrière.'

Gervinus, Georg Gottfried (1805-71), Ger. historian, b. at Darmstadt, and brought up for the mercantile profession, but he soon abandoned this for the study of hist. In 1835 he was appointed professor-extraordinary at Heidelberg, and in 1836 prof. of hist. and literature at Göttingen, from which he was dismissed in 1837 for signing the protest against the conduct of King Ernest Augustus. He went to Heidelberg, and in 1847 started the *Deutsche Zeitung*. In 1848 he was chosen a member of the Frankfurt National Assembly, and in 1850 was sent to London on a diplomatic mission in which he was unsuccessful. G. was a true patriot and a defender of constitutional liberty which is shown by his writings as well as by his conduct; his *Introduction to the History of the 19th Century* and his *History of the 19th Century* led to his imprisonment. His other most important works are *History of German Poetry* (1835) and *Shakespeare* (1849). See J. Dorfel, *Gervinus als historische Denker*, 1968, and M. Rychner, *G. Gervinus* (Bern), 1922.

Geryon (from γέρων, the howler or roroner), represented in Gk. mythology as a monster with three heads. He was the son of Chrysaor and Callirrhoe, and king of the is. of Erytheia. He had herds of red cattle which were guarded by the giant shepherd Eurytion and the two-headed dog Orthrus. One of the twelve labours imposed upon Heracles by Eurystheus was the capture of these cattle.

Gerzen, Alexander, see HERZEN.

Gesenius, Heinrich Friedrich Wilhelm (1786-1842), the great reviver of Heb. philology, b. at Nordhausen. He studied at the univs. of Helmstadt and Göttingen. In 1811 he was elected prof. of theology at Halle, a post he held to the day of his death. G. set him self to revive the study of Heb., bringing forward a new and improved method of treating the language by separating the grammar and the lexicon. In 1810-12 he pub. *Hebräisch-deutsches Handwörterbuch des Alten Testaments*; in 1815 appeared *Neues Hebräisch-*

deutsches Handwörterbuch; both these lexicons have been trans. into Eng. See H. Gesenius, *Wilhelm Gesenius*, 1886.

Gesner, Conrad von (1516-65), Swiss writer and naturalist, b. at Zürich. Hallam says: 'Endowed with unwearied diligence, and with a mind capable of omnifarious erudition, Geuner was probably the most comprehensive scholar of his age.' He studied at Strasburg, Bourges, and Paris, and was appointed prof. of Gk. at Lausanne in 1537. In 1541 he became prof. of natural hist. at Zürich. G.'s favourite study was probably botany, and he pub. in 1542 a *Catalogue of Plants* in four languages: Lat. Gk., Ger., and Fr. He enriched his botanical knowledge by frequent journeys, and founded a small botanical garden at Zurich. Another important work of his is *Bibliotheca universalis*. This is a catalogue of all the writers who had ever lived, with their works, and is written in Heb., Lat., and Gk. In 1551-58 appeared his great zoological work *Historia animalium*. Besides these he wrote *Mithridates de differentiis linguis*, an account of about 130 languages, and the Lord's Prayer in twenty-two tongues. See H. Bues, *Schweizer Arzte als Forscher, Entdecker und Erfinder*, 1915; also studies by P. A. Cap, 1861; J. Hartart, 1924; and W. Ley, 1929.

Gesner, Johann Matthias (1691-1761), Ger. classical scholar, b. at Roth near Nuremberg, and studied at Jena. In 1715 he became prof. and librarian at Weimar; in 1728 he was made headmaster of the gymnasium at Ansbach (Anspach). In 1730 he was appointed head of the Thomas School at Leipzig, and in 1734 became prof. and librarian at Göttingen. His works include *Philopatris* (1711), ascribed to Luelan; eds. of the *Scriptorium rei rusticae* of Claudian, Horace, Quintilian, and Pliny the Younger; *Primum linea ritagines in eruditissimum universitatem* (1736); *Novus linguae et eruditissimus Romanus thesaurus* (1719); *Opuscula minora rarit argumenti* (1713-45); *Thesaurus epistolicus Gesnerianus* (ed. Klotz, 1768-70); and *Indice etymologicus latinatio* (1749).

Gessner, Salomon (1730-88), Swiss painter and poet, b. at Zürich. He first became famous by his *Lied eines Schweizers* in 1751. Other writings of his are *Daphnis* (1751), *Idyllen* (1753), *Inkel und Der Tod Abels* (1759), and *Eraunder und Steinma* (1768), which latter was trans. into many languages, including Welsh, and may be described as 'a sort of idyllo prose pastoral.' His works are sentimental, insipid, and feeble, but they achieved universal popularity at the time of their pub. owing to the appreciation of Goethe, Lessing, and Herder. His paintings are mostly in water-colours, but he also executed some very fine engravings. His *Letters on Landscape Painting* were pub. in 1772. His paintings are delicate, but like his writings border on feebleness. See Bertha Reed, *The Influence of Salomon Gessner on English Literature*, 1905.

Gestapo, abbreviation for Gehelmer-

staatspolizei, the Ger. secret police. It was deliberately organised as an integral part of the Nazi machinery of coercion soon after the rise of Hitler to power in 1933. Its ramifications extended throughout G. into every kind of anti-Nazi organisation, and by methods of terrorism it soon stamped out all resistance to Hitler. Its agents supervised the conduct and even the utterances of the whole population and exercised the power of arbitrary arrest wherever opposition was found. The head of the G. was Heinrich Himmler (q.v.), supreme commander of the *Schutz Staffel* (S.S.) (q.v.). The G. was pronounced at the Nuremberg trial of war criminals (1946) to be a criminal organisation. See also CONCENTRATION CAMP; AUSCHWITZ; BELSEN.

Gesta Romanorum ('Deeds of the Romans'), name given to a collection of short, didactic Lat. stories which was compiled probably at the end of the thirteenth century, or at the beginning of the fourteenth. Its authorship is unknown, and its title is only partly appropriate, for at the present time it contains fragments of oriental and European origin as well as those from Lat. and Gk. hist. The style of 'he .ook is bad, but it is interesting from a literary point of view, for it contains the sources of the writings of Gower, Chaucer, Shakespeare, and others, e.g. Chaucer's *Man of Law's Tale* and the main outlines of Shakespeare's *King Lear* and *Pericles*, and the incidents of the caskets and the pound of flesh in *The Merchant of Venice*, and Longfellow's *King Robert of Sicily*. The first printed ed. of the modern form of G. R. was issued at Utrecht about 1173, and an ed. in Eng. was printed by Wynkyn de Worde, 1510-15. There is a good modern trans. by C. Swan in Bohn's Library and a selection trans. into Ger. by H. Ilesse.

Gestation, the retention of the young in the uterus from the time of the fertilisation of the ovum—that is, conception—to the moment of delivery. The period of G. varies with the number of the offspring and the degree of their development at birth, with the size of the mammal, and, above all, with its status in the scale of evolution. The longer duration of the condition of pregnancy is an important factor in the growth and evolution of the higher species. For women the period varies considerably above and below nine months. As regards animals which have litters the normal length of G. for a rat is 28 days, for a rabbit 35, and, for a bitch 62 days. The G. of a sheep, cow, and mare usually lasts five, nine, and eleven months respectively. For a giraffe the period may be 430 days, and for an elephant more than 600 days.

Gesualdo, Carlo, prince of Venosa (c. 1580-1613), It. musician, b. in Naples; son of Fabrizio, second prince. Carlo was renowned as a performer on the bass-lute. He married his first cousin Maria d'Avalos, who, though only twenty-one, had already been married twice and had children. Carlo and she had one son. She became paramour of Fabrizio Carafa, third duke of Andria; Carlo

killed them on the night of Oct. 16, 1590, and caused her lately born child to be shaken to death. He fled to the castle of G. and succeeded his father as prince (1591). In 1594 he married Eleonora d'Este, at the court of whose family, at Ferrare, he afterwards resided, occupying himself with melancholy musings—being, as a composer, a law unto himself. He is supposed to have returned to G., where, in remorse, he founded the Convento del Cappuccini, and to have died there. See C. Gray and P. Hesseltine, *Carlo Gesualdo*, 1926.

Gete, tribe of Thracian extraction, mentioned in hist. in the time of Alexander the Great as dwelling on the banks of the Danube. In the middle of the fourth century they settled in Transylvania and were conquered in 515 B.C. by Darius, king of Persia. Both Alexander the Great and Lysimachos made attempts to subdue them, but without success. They became politically united with the Dacians in the early part of the first century B.C., and during the greater part of the first century A.D. continued to harass the Roman legions. In A.D. 106 they were conquered by Trajan and their country incorporated in the Rom. Empire. See H. Meiss, *Die Dobrudscha im Altertum*, 1911.

Gete, riv. in Belgium, which flows through prov. of Brabant and Limbourg. It joins the R. Demer near Diest. Its banks were the scene of a fierce battle in May 1910 to delay the Ger. advance.

Gethsemane (Aramaic, from *gath*, wine press; *shemen*, oil), small place, about three-quarters of a mile from Jerusalem, at the foot of the mount of Olives, on the E. of the brook Kidron. It contained a garden, the favourite resort of Christ and His disciples, and was the scene of the agony on the night before the Passion. The site is identified with a square enclosure and is supposed to be near the real location, though recent explorers consider it to be too near Jerusalem to be G. itself.

Gettysburg, U.S.A., bor. and c. seat of Adams's co., Pennsylvania, situated on the W. Maryland and the Philadelphia and Reading railroads, and 35 m. S.W. of Harrisburg. It is an agric. region, built on and surrounded by picturesque hills, and contains sev. mineral springs of medicinal value. It is the seat of a Lutheran theological seminary and of Pennsylvania College, founded in 1826 and 1832 respectively. The industrial establs. comprise granite-yards and various manufs. G. was founded in 1770 and incorporated as a bor. in 1806. The battle named after it, and one of the most important of the civil war, was fought here in 1863 when the S. general, Robert E. Lee, was defeated by the northerners under Meade, and a battle monument, surmounted by a statue of Liberty, now rises from the brow of the hill. Abraham Lincoln's celebrated dedicatory address was made here on Nov. 19, 1863. Pop. 5900.

Geulinckx, or Geulingx, Arnold (1624-1669), Dutch philosopher, b. at Antwerp, and one of the disciples of Descartes. Studied philosophy and medicine at

Louvain and graduated as doctor. He lectured at Louvain Univ., 1648-58. In 1665 he was appointed prof. of philosophy at Leyden (he is a leading exponent of the speculative doctrine known as "Occasionalism" and the salient point of his teaching is an endeavour to explain the relations existing between body and soul). In his lifetime there were publ. only the theses which he defended on graduating at Louvain *Saturnalia, seu quaedam disputatio* (2nd ed. 1665). His chief works in the hist. of philosophy are *Metaphysica terrena* (1691) and *Dive Ethica, post tristia auctris fata* (1696 first part 1665). Besides these he wrote *Physica et Logica restituta* and *Annotationes in Principia Philosophiae R. Cartesii*. See J. P. N. Lind. I

separated from it and given to Geneva, the rest becoming part of the dept. of Ain. Pop. 2000

Geyser (Icelandic *geysir* to burst out violently), mts. of hot water and steam of an eruptive nature met with in various quarters of the globe more especially in Iceland and New Zealand. A geyser consists of two parts a basin and a tube. Deposits of silica, formed as the water evaporates and sometimes becoming like a crater, form the basin of the geyser, whilst the tube leads beneath the surface, and in it water accumulates and is gradually heated until steam overcomes the pressure of the water, and a column of hot water is projected into the air through the tube. The G. in Iceland are the best known in the world. They are situated



FRYING PAN HOT GEYSER, ROTORUA, NORTH ISLAND, NEW ZEALAND

Geulinx und seine Philosophie, 1850. J. Grimm, *Die Geulinx-Freudenthaler Schriften und Oeconomia*, and *Studien* by E. Pfleiderer (1852) and G. Santleben (1855).

Geum, genus of herbaceous perennials plants of the order Rosaceae, including about forty species, of which the wild avens (*G. rivale*) with orange flowers, and the wood avens (*G. urbanum*) are found in Britain. The wild avens and other species are grown in gardens as border and rockery plants.

Gevelsberg, tn. in Westphalia, Germany, 28 m. from Düsseldorf. It has iron and steel works, and manufactured steel ware, gas stoves, and machinery. Pop. 22,000.

Gex, tn. of France in the dept. of Ain on the Jura Mts., 11 m. NW of Geneva. It has a station on the famous Paris-Lyon-Mediterranean railway. There are tanneries in the tn., and cheese is made. G. was formerly a district of ancient Burgundy and, in the sixteenth century, Geneva and Beine disputed its possession with the duke of Savoy. Henry IV acquired it by treaty in 1601. In 1815 six cantons were

within sight of Mt. Hélyet, and are the hottest springs in Europe. The G. of New Zealand are celebrated principally on account of the beautiful terraces associated with them. The basins connected with these G. are much used by bathers and resorted to by invalids. The Yellow stone region in N. America also abounds in G. The three localities mentioned are where G. attain their highest development, but they also exist in many volcanic regions such as Japan, S. America, and the Malay Archipelago.

Gezelle, Guido Pierre Théodore Joseph (1830-99). Flemish priest and poet was b. at Bruges the son of a gardener. He was trained for the priesthood and after ordination held teaching posts at Roulers and at Bruges until jealousy on the part of his superiors forced him to accept a curacy at Courtrai. There he spent twenty-five years, and did not return to Bruges till the last year of his life. He is one of the most individual figures in the revival of Flemish poetry, his work being marked by a blend of religious and patriotic fervour. He was elected a member of the Flemish academy. Besides various trans. from

Eng. and Fr. tr. pub. *Kerkhofblommen* (1858); *Dichterfelingen* (1858); *Gedichten* (1863); *Volledige Gedichten* (4 vols., 1878-1880); *Lieder* (1880); *Sijdkrans* (1893); and *Rijmsnoer om en om het Jaar* (1897). His collected works were pub. 1901-5.

Gezer, city in Palestine, referred to in the Bible as the city of Dan. It is situated in the low hills W. of the Jerusalem Mts. In ant. geography it was a Canaanite city within the ter. of Ephraim. Its site is the modern Tel Jezar. About 1500 B.C. it is noticed as a trib. to Egypt. Since 1902 the Palestine Exploration Fund has been employed in excavating, and has made some interesting discoveries. See R. Macalister, *The Excavations of Gezer*, 1912.

Gfrörer, August Friedrich (1803-61). Ger. historian, b. at Culm in the Black Forest. He studied theology at Tübingen, and afterwards went to Lausanne, Geneva, and Rome. In 1830 he became librarian in the public library of Stuttgart, and devoted himself almost entirely to historical studies. In 1831 he produced *Philo und die judisch-alexandrinische Throsophie*, followed in 1835 by *Gustav Adolf*, chiefly written with the object of bringing into prominence the political role of the Swedish king, rather than the religious. In 1847 he was called to the chair of hist. in Freiburg, and in the following year was sent to the Frankfort Parliament. His other most important works are *Allgemeine Kirchengeschichte* (1841-46); *Untersuchung über Alter, Ursprung, und Werth der Decretales des falschen Isidorus*, on the pseudo-Issorian Decretals (1848); *Urgeschichte des menschlichen Geschlechts*, on the primitive hist. of mankind (1855); *Geschichte der Karolinger* (1858); and *Papst Gregorius VII.* (1859). All his works display great learning, but his conclusions are ingenious rather than sound. He d. at Carlsbad. See life by M. Omelin, 1879.

Ghadames, see GADAMES.

Gharalpur, or **Gharapuri**, see ELEPHANTA ISLAND.

Gharbiya, maritime prov. of Lower Egypt. Area 2818 sq. m. Pop. 2 338,896.

Ghara, see GARDALA.

Ghat, tn. and sandy oasis in the Sahara desert of Africa, which has belonged to Turkey since the year 1874. Pop. about 4000.

Ghats, or **Ghauts** (Sanskrit, gates, passes, or land-stairs), two converging ranges of mts., known as the E. and W. G., running parallel with the E. and W. coasts of S. India. The W. range starts from the Tapti valley and forms an almost unbroken and precipitous barrier of rocks, the prin. passes being the Thalikat and the Bhonghat. On the landward side there is a gradual slope to the table-land of the Deccan, and the W. G. appear as low hills, forming the edge of the plateau. The E. G. begin in the neighbourhood of Belasor and run through Madras. They are of a more broken character, with an average height of 1500 ft. Both ranges abound in health resorts.

Ghazali, Abu Mohammed Al (1058-1111), Moslem theologian and philosopher, known in the W. as *Algazel*, b. at Tus in

Khorassan. He studied both at Tus and Nishapur, and was appointed to a chair of philosophy in the univ. of Bagdad at the early age of thirty-three. He held this position for only four years, after which he spent some time in travelling and teaching at Damascos, Jerusalem, and Alexandria. G. struck a serious blow at the philosophy of the Arabians, for he represented the critical, if not sceptical, side of Arabian philosophy, casting doubt on the metaphysical teachings of the exponents of Aristotelianism. After his travels he returned to his native city, where he founded a Sufic College, to which he dedicated the remainder of his life in religious and philosophic meditation. He pub. numerous works, the most notable of which are the *Opinions of the Philosophers* and *Tendencies of the Philosophers*, introductions to his prin. work, *Destruction of the Philosophers*. See lives by D. B. Macdonald in Jour. of Amer. Oriental Society, 1899, and C de Vaux, 1902.

Ghaziaabad, tn. in the United Provs. of India in the Meerut dist., situated 15 m. E.N.E. of Delhi. There are barracks and a trade in leather, skins, grain, etc. It is an important railway junction. Pop. 12,000.

Ghazipur, city of India in the United Provs. It is the cap. of the G. dist. and is situated on the L. b. of the Ganges, 44 m. N.E. of Benares. It is the headquarters of the gov. opium dept., and the opium is manufactured here. The city extends along the Ganges for about 2 m., and the ruins of the Palace of the Forty Pillars are to be seen here. There is also a marble statue erected to the memory of Lord Cornwallis. A trade in sugar, rose-water, tobacco, coarse long-cloth, etc., is carried on. Pop. 10,000.

Ghaznevids, or **Ghaznevides**, famous Moslem dynasty of twenty-one rulers, founded by the freedman, Alptegin (Alp-Tigin) of Bokhara, at Ghazni, Afghanistan, about A.D. 962. He withstood the Samani dynasty, and his successors Selukbeghan (Seluk-Tigin), 977-97, and Mahmud, 999-1030 (the most celebrated of the line), extended their sway over Kabul, Peshawar, and Lahore to N. and E., to Bagdad and the Caspian on W. and N.W. The poet, Firdausi, and the philosopher, Avicenna, flourished at Mahmud's court. Later rulers were Masud I. (1030-41), Mandud (1042-48), Farrukh-yad (1053-59), Ibrahim (1055-1099), Bahram (1117-50), Khusru Malik (1160-86, last of the dynasty). The cap. was moved by the last three kings from Ghazni to Lahore in India. The power of the G. was shattered by the rulers of Ghur (about 1152), and finally overthrown by Shihab ud-Din Mohammed, Prince of Ghur (1186). Ghazni was destroyed by the Mongols under Jenghiz Khan in 1224. It was the site of Brit. struggles for possession in Afghanistan in 1839 and 1842.

Ghazni, Ghuznoe, Ghizni, or Gazna, tn. and port of S.E. Afghanistan, on R. G., 80 m. S.W. of Kabul. Near by are ruins of the ant. city, important in the Middle Ages and one of the finest cities in Asia

under Mahmud (eleventh century). G. is surrounded by a mud wall, and is commercially important as being on the caravan route from Persia to India. It stands about 8000 ft. above sea level. The Brit. stormed the tn. in 1839, and recaptured it from the Afghans in 1842. There are two famous towers, and the site of Mahinud's tomb. The celebrated 'gates of Samnath,' kept here from about A.D. 1000, were removed to Agra by the Brit. in 1842. Moslem pilgrims frequently visit its numerous shrines. Trade

and sixteenth century), one of the best examples of pure Gothic in Belgium, and with magnificent marble interior decoration. The cathedral is rich in art treasures, amongst them the famous 'Adoration of the Lamb' by the brothers van Eyck. Other famous churches are the thirteenth-century church of St. Nicholas, the church of St. Jaques, with its twelfth-century Rom. facade, the sixteenth-century church of St. Michael containing van Dyck's 'Crucifixion,' and the baroque church of St. Peter. Nor is G.



GHENT: THE QUAI AUX HERBES

EN 4

in fruit, skins, and wool is carried on Pop. about 10,000.

Ghebres, see **GBRES**.

Ghees, see **GEEL**.

Gheimir, El. see **KISM**.

Ghent (Dutch *Gent*, Fr. *Gand*), cap. of the prov. of E. Flanders and one of the most important cities in Belgium. It is situated at the junction of the Rs. Lys and Scheldt, 34 m. from Brussels. The city is divided by its many streams and canals into twenty-six is., connected by sixty-four bridges. The building of new roads and streets has destroyed much of the medieval character of the city, but many of the old buildings are still preserved in their original states. The city has an area of 14 sq. m. and a pop. of 166,000; or, including the suburbs of St. Amadsberg, Ledeburg, and Gentbrugge, 20 sq. m. and 217,000 people. The best view of the city is to be had from the 315-ft. sheltry (1183-1339) in the city centre. In 'ost famous of the many churches the cathedral of St. Bavon (twelfth-

deficient in beautiful secular buildings; the castle of Gravenstein (1180) is considered the most perfect example of a medieval fortress in Belgium. Also worth seeing are the Duyvelsteen (1245), the Cloth Hall (1325), the tn. hall (1519-1620), and the numerous old guild houses, one of which dates back to the thirteenth century. There is still to be seen an arch of the old Prinsenhof, where Charles V. was b. in 1500. G. has about twenty monasteries and three *béguinages* or convents, the oldest being of the thirteenth century. The squares of G. have played a great part in hist., especially the Marché du Vendredi. There are also sev. museums. G. is a great industrial centre, and leads all Belgium in textile production, which employs about half the city's available man-power. The cotton mills of G. house twice as many spindles as all the rest of the country. Machinery and chemicals are also manufactured in considerable quantities. In and around the city are hundreds of nursery gardens, producing

large quantities of azaleas and begonias for export. A world-famous flower show, the Floralis, is held in G. every five years. G. is the second port of Belgium, and has excellent harbour and port facilities to cope with its large volume of foreign trade. A ship canal gives direct communication between the Grand Bassin and the harbour of Terneuzen in Holland and the Scheldt. A new lock at Terneuzen allows passage to vessels up to 26 ft. draught at any tide between that port and G. G. is the seat of a bishopric—and of the Royal Flemish Academy—it has a court of appeal, a commercial court, and sev. consular representatives.

G. has played a great role in hist.; it was first mentioned in the seventh century. It waged violent wars against Flanders and Burgundy, and Charles the Bold rebelled against Charles V. and Philip II., and was sev. times captured by the Fr. It was incorporated in the kingdom of the Netherlands under the peace of Paris in 1814, and passed to Belgium on the estab. of that kingdom in 1830. During the First World War G. was occupied by the Ger. from Oct. 1914 till the armistice. In May 1910 the retreating Allies blew up many of the brd., and there was also some bomb damage, but fortunately no historic monuments were affected. In May 1940 G. was again occupied by the Ger., and was liberated on Sept. 6, 1944.

Gherardesca, Ugolino, see UGOLINO DELLA GHERARDESCA.

Ghetto name of the Jewish quarter in It. cities, and later in others. Originally Jews were strictly confined to this part and quite separated from their Gentile neighbours. The G. of Rome, instituted by Pope Paul IV., 1556, was only removed in 1885 on the making of the new Tiber embankment. There were 'Jewries' in England, in London, Lincoln, Oxford, and York. The derivation of the word is very uncertain (*borghetto*, little bor.?). The system became obsolete about 1870, but the name is still used to mean Jewish quarters. See H. Heine, *Der Rabbi von Bacharach* (Included in his collection entitled *Der Salon*), 1834-40; D. Philipson, *Old European Jewries*, 1894; I. Abrahams, *Jewish Life in the Middle Ages*, 1896; and *The Jewish Encyclopedia*; also works of C. Franzos and I. Zangwill.

Ghibelline, see GUELPHS AND GIBELLINE LINES.

Ghiberti, Lorenzo (1378-1455), It. goldsmith, painter, and sculptor. He studied design under Bartoluccio, and in 1400 executed a fine fresco at Rimini in the palazzo of Pandolfo Malatesta. His design for the bronze gates to the baptistery of St. John at Florence was preferred to those of his competitors, Brunelleschi being one of them. Scenes from the O.T. were represented, and later G. did another still finer gate. Michelangelo gave them the highest praise. The first gate was completed in 1424, the second 1452. Other masterpieces are statues of St. Matthew, St. John the Baptist, and St. Stephen for the church of Orsanmichele (1414-22); bas-reliefs for the Catherine of Siena and sarcophagus of St. Zenobius in

Santa Maria del Fiore, Florence; sepulchral monuments of Dati and of the Albizzi at Florence (c. 1427). The bas-reliefs of the shrine of San Zenobi are especially fine. G. did much to restore the antique style in sculpture. In beautiful ornamentation and perfection of form and finish in all details he has never been surpassed. His earliest known work, a bronze-relief of the 'Sacrifice of Isaac,' is in the Uffizi. G. was chosen as colleague of Brunelleschi in the erection of the Florentine Duomo. See L. Cleognara, *Storia della Scultura*, 1823; L. Scott, *Ghiberti and Donatello*, 1882; C. Perkins, *Ghiberti et son école*, 1885; G. Vasari, *Lives of the Painters and Sculptors*, 1885; and Lord Balcarres, *Evolution of Italian Sculpture*, 1909, and lives by H. Gollob, 1929, and J. von Schlosser, 1941.

Ghika, Helena, Princess Koltzoff, Massalsky (1829-88), Rumanian writer, better known by her pen-name 'Dora d'Istria.' A daughter of Prince Michael, she married a Russian prince, 1849, and travelled widely in Europe. After 1855 she lived mostly at Florence. She studied classics under Pappadopoulos, and was a distinguished landscape painter. Her works include *La Vie monastique dans l'église orientale* (1855); *La Suisse allemande* (1856); *Les Femmes en Orient* (1860); *Des femmes, par une femme* (1864); *Gli Albanesi in Rumania* (1873); *Storia dei Principi Ghika* . . . (1873); and *La Poésie des Ottomans* (1873). See B. Cechetti, *Dora d'Istria*, 1871.

Ghika, Jon (1817-97), Rumanian statesman, studied at Paris, becoming prof. of mathematics and political economy at Jassy, 1843-45. A leader of the revolution of 1848 in Wallachia, he was representative of the provisional gov. at Constantinople. In 1854 the sultan made him governor of Samos, and prince, 1856. Next year he returned to Wallachia. G. was Prime Minister under Prince Charles, 1866-67 and 1870-71. He helped to establish the hereditary principality of Rumania, 1866. He was Rumanian minister in London, 1881-90. His works include *Conorbiri Economici* (1866-73); *Letters to Vasili Alessandri* (1887); *Memories of Irile* (1890); and trans. of sev. plays of Shakespeare. His collected works were pub. in 4 vols. (1914-15).

Ghilan, prov. of N.W. Iran between the S.W. border of the Caspian Sea and the Elburz Mts. It is low-lying, swampy, and unhealthy towards the Caspian, but more salubrious where the ground rises to the S. Has vast forests. The soil, where cleared, is fertile and well cultivated. The fish rics are good.

Ghillais, see GILTYAKS.

Ghilzais, warlike clan of Pathan stock in E. Afghanistan, between Kabul and Kandahar. By language they are Aryan, and Holdich (1889) believes them to be of Turkish origin. A race of sturdy farmers and shepherds, they were a severe menace to the Brit. troops during the retreat from Kabul, 1842. They profess Mohammedanism, but some of their customs tend to reveal the existence among them of a primitive Christianity.

Ghirlandajo, or Ghirlandajo, Domenico (c. 1449-94) (properly Domenico Bigordi, or Corradi), surnamed Il Ghirlandajo or Grillandajo (garland-maker), after his father Tommaso Bigordi, a goldsmith. He was a celebrated painter and mosaicker; founder of a famous school of painting and the first Florentine to attain skill in aerial perspective. He studied under Baldovinetti, and was influenced by Castagno, Masaccio, and Verrocchio. Among his pupils were his two brothers Davide and Benedetto, Michaelangelo, Francesco Granacci, and Bastiano Mainardi. Domenico painted numerous scenes from the lives of the Virgin and John the Baptist. He executed frescoes in Florence in the church and refectory of Ognissanti (1480), only 'The Last Supper' and 'St. Jerome,' being left; in the Sassetti chapel in Santa Trinita (1485); 'Life of Saint Fina' in the Capella Fina (1475); in the choir of Santa Maria Novella ('St. Francis,' 1485-90); in the chapel of the Innocenti (1483); and in the Palazzo Vecchio (1481). His pictures include two 'Holy Families' (Berlin); 'Adoration of the Shepherds' (1485) (Florence Academy); 'Madonna and Child with Saints'; 'St. Catherine of Siena' and 'St. Lawrence,' in the Pinakothek at Munich; 'Adoration of the King' (1487); 'The Visitation' (1491) (now in Louvre); 'The Birth of the Virgin' (1490); 'The Calling of St. Peter and St. Andrew' (1485) (Sistine Chapel Rome). See R. Zurcher, *Italienische Wandmalerei*, 1944; also studies by E. Steinmann (in Knackfuss's *Kunstler Monographien*), 1897; C. S. Davies, 1908; and J. Lants, 1943.

Daride (1452-1525) and **Benedetto** (1458-97), brothers of Domenico, assisted him in his works, but left no original ones. Davide helped Domenico in the mosaic of the 'Annunciation' over the N. portal of Florence cathedral, and executed others at Orvieto, Florence, and Siena.

Ridolfo (1483-1561), son of Domenico, was a skilful painter and friend of Raphael. His works include 'Coronation of the Virgin' (1503, in Louvre); '(Annunciation' (Uffizi, Florence); 'Goldsmith' (Uffizi Palace), formerly attributed to da Vinci; 'Nativity' (Berlin Museum); 'St. Zanobius raising a Dead Child' and 'Burial of St. Zanobius' (Uffizi, Florence); 'Madonna della Misericordia'; 'Virgin adored by Saints.'

Ghiura, see GAZROS.

Ghizeh, see GIZI II.

Ghizni, see GHAZNI.

Ghoorkhas, see GHURKAS.

Ghose, *Lalmohun* (otherwise *Lalamohan*) *Ghosa* (1849-1909) Bengal politician and orator; b. Dec. 17, at Krishnagar, son of Ral Bahadur Ram Lochan C. of a Vikrampur family. In the early seventies he was called to the Eng. Bar. In 1879 he returned to England to protest in a representative capacity against certain features in the policy of the viceroy, Lord Lytton. John Bright took the chair at one of his meetings. He came to England again in 1880, and again at the end of 1884; and in the general elections of 1885-1886 he stood as a Liberal for Deptford. Member of Bengal Legislative Council,

1892-95. In 1903 president of the Indian National Congress at Madras. He left an unfinished *Life of Napoleon*. See A. Banerjea (ed.), *Speeches of L. Ghose*, 1883-84.

Ghost (animal), see LEMUR.

Ghosts, see APPARITIONS; HALLUCINATION.

Ghûr, or Ghore, Gaur, Gour (Sanskrit, fort), mt. region of W. Afghanistan, 120 m. S.E. of Herat, stretching towards Kandahar. It is in part the site of the ant. Paropamisus, and medieval Gharshistan. In all ages the country has been inaccessible, and the site of the old cap. Firoz Koh cannot be definitely fixed. The peak Chalap Dulan or Koh-i-Kaisar is 13,000 ft. high. The present pop. are mostly Tagaras or nomad Aimâks. Since 1815 G. has been included in the ter. of Herat. It was famous in the twelfth and following centuries as the seat of a native dynasty, the Ghûri, founded by Ala-ed-Din Jahansoz, who burnt Ghazul, 1152, and harassed the Ghaznevids. His successors extended their empire and completely subdued Ghazni, 1186. Out of their victories grew up the Mogul kingdom of Delhi, and the preponderance of Islam in Hindustan dates from this time. Their power was broken by Mohammed Shah, and Jelal Ed-Din of Khwarezm (Khiva), 1211-16. A short revival took place under the Kurt dynasty, 1245, but the final overthrow came with Timur's capture of Herat, 1383. See also AFGHANISTAN. See J. Ferrier, *Caravan Journeys*, 1856.

Ghûrkhas, Goorkhas, or Ghorkhas, predominant race of Nepal in the Himalayan region. They are hardy mountaineers of Hindu descent, speaking a Sanskritic dialect. Driven out of Raiputana by Moslem invaders, they conquered Nepal after much fighting, 1677-68. The G. now form some of the best troops in the Indian Army. The E. India Company came into conflict with them, 1814, but peace was soon declared, the company obtaining possession of the S. slopes of the Himalayas, but recognising Nepal's independence. Ghûrkhâ is the name of a number of famous Indian regiments. They were loyal to England during the mutiny, and the Shrooer Battalion greatly distinguished itself at Delhi, for which it was given the status of a 'rifle regiment,' and granted a unique trophy called a 'truncheon,' which much resembled a very ornate drum-major's staff made of silver. This unit was later designated the 2nd King Edward's Own Ghûrkhâ Rifles. All of the ten regiments of G., served during the First World War, either in France, Flanders, Gallipoli, Mesopotamia, Persia, Baluchistan, Egypt, Palestine, or the N.W. Frontier of India. Their roll of battle honours commences with Bhurtpore, and includes the Second and Third Afghan wars, Burma campaign, Indian mutiny, and China 1900 campaign. Also fought under Gen. Wavell against the IIs. In the battle of the W. Desert, 1940, and later in the Burma campaigns and on the W. Front.

Ghuznee, see GAZNA.

Giambattista, *Tirpolo*, *Giovanni Battista*, and *Cipriani*.

Gianibelli, or Giambelli, Federigo (c. 1530-92), It. military engineer, inventor of the 'infernal machines' that wrought so much havoc among the troops of Parma near Antwerp, 1585. By means of an explosive ship he destroyed the bridge built by the Spaniards across the Scheldt. G. then went to England and assisted in the preparations against the Aruado, designing the fireships sent among the Sp. fleet. See Motley, *United Netherlands*, vol. i.

Giannone, Pietro (1676-1748), eminent It. anti-papal historian. He studied law and practised as a barrister at Naples, spending many years in composing his *magnum opus* - *Storia civile del regno di Napoli* (1723). This attack on the abuses of the Rom. Catholic Church led to his banishment. He retired to Vienna, Venice, and finally Geneva, where he wrote his diatribe *Il Trucno* against papal authority. He was enticed into Savoy by Gusaldini (1736), arrested by order of the king of Sardinia, and confined at Turin till his death. His *Opere Postume*, containing 'Aneddoti ecclesiastiques' (1738), appeared 1760. Mancini issued his *Opere Inedita* (1859). See Panzini, *Vita di P. Giannone*, 1765; Fabroni, *Life, Itinerarium doctrinae excolentium*; Pierantoni, *Autobiografia di P. Giannone*, 1890; Tipaldo, *Biografia degli Italiani illustri*; and Corniani, *Secoli della Letteratura Italiana*.

Giannuzzi, Giulio Pippi d&, see GIULIO ROMANO.

Giant Hill, above Corfe Abbas, 8 m. N. of Dorchester, England. On it is the figure of a man, cut in the chalk, of indeterminate age, but believed to date from the Rom. era in Britain.

Giants (Gk. γίγαντες, giant), name given to adult human beings of abnormal size and stature. All races have a standard average height both for men and women. The average height of the whole human species is 5 ft. 3 in., the tallest giant exceeding this by about 3 ft. 10 in. The Akkas of central Africa are about 4 ft. 5 in. in height, the Scottish farmers of Galloway 5 ft. 11 in. The true causes of such noticeable differences in racial stature are much discussed by ethnologists. The ancients held that the first men on earth were mighty and god-like, and that they degenerated in vigour and size. Others have tried to prove that the first men were of dwarfish appearance. Among famous G. may be mentioned Og, king of Bashan (Deut. 31, 11); Magrath, Bishop Berkeley's giant; Patrick Crotter (1761-1804); Charles Byrne; Winkelmaier's Austrian (*ad.* 1887); Topinard's Finland (9 ft. 4 in.); Chung, the Chinese giant; and the Russian Machnow (9 ft. 3 in.) who appeared at the London Hippodrome, 1905. Such abnormal beings are often dull of intellect, weakly, and ungainly. As a disease 'giantism' is closely allied to 'acromegaly', caused by a morbid process in the sphenoid bone of the skull, an excessive development of the anterior lobe of the pituitary body. If this condition occurs in early youth the whole of the limbs are affected and gigantic proportions are the result.

Remains found in the Montone caves and in Scotland go to prove a giantism that was racial and not the result of disease. The villagers of Balmacelain in Galloway are taller on the average than the oft-quoted Tehuelches of Patagonia. In mythology the title giant was applied to men of pre-eminent strength or prowess, not necessarily of great size. Among the various Gk. conceptions were Enceladus, Typhoeus, Briareus, the Titans, and the



C. W. Jones

THE GIANT'S ORGAN, GIANT'S CAUSEWAY

Cyclopes. The great representation of the Cyclopes (a mighty battle between the G. and the gods, later than Zeus's overthrow of the Titans, but mentioned neither by Hesiod nor Homer) is sculptured upon the altar at Pergamum. See C. Weinhold, *Die Riesen des germanischen Mythos*, 1858; E. J. Wood, *Giants and Demons*, 1864; Sir E. Tylor, *Early History of Mankind*, 1878, and *Primitive Culture*, 1891; M. Meyer, *Die Giganten und Titanen in der antiken Sage und Kunst*, 1887; R. Gould, *Enigmas*, 1929; and P. H. Fletcher, *Giants and Dwarfs: the Anterior Lobe of the Hypophysis*, 1923.

Giant's Causeway, famous promontory of closely packed basaltic columns on the

coast of Antrim, N Ireland, W of Benmore Head, 8 m from Portrush. Its origin was a great outpouring of basalt in the Tertiary period but legend ascribed it to Finn McCoul or Kingal, who built it as a bridge between Ireland and Scotland for the giants to cross from Antrim to Staffa. The columns are mostly hexagonal or pentagonal about 40,000 in number perfectly articulated by means of convex and concave joints. The three chief portions are the Little, Middle and Grand Causeway. The last extends 500 ft out to sea and is 60 to 120 ft broad. Other detached groups are called Giant's Loom, Giant's Organ, Lady's Fan. I of the Causeway is the Giant's Amphitheatre, a bay with cliffs 30 ft high. Beyond is Sp Bay, where an Armada vessel was wrecked. Chimney Point and Pleasance Head are also near and the ruined castles of Dunseverick and Dunlough. See also POT HOIUS.

Giaour (corruption from Arabic *laifr* unbeliever or Persian *gaur* infidel) name by which the Turks designate all those who reject Mohammedanism especially European Christians. The word is spelt in the 1st fashion popularised by Byron and usually employed in an offensive sense.

Gib, Adam (1714-88) Scottish 'anti-burgher' leader and preacher b at Castletown Perthshire. He was the only Edinburgh minister who strongly upheld the Protestant succession (1745). He led the minority in the Anti-Burgher Synod of 1747, and in after years his fame as a preacher drew enormous congregations to his church in Nicolson Street. He earned the sobriquet of 'lope Gib' on account of his dictatorial manner. Chief works *Proceedings of the Associate Synod* (1719), *The Present Truth* (1774), and *Sacred Contemplations* (1746).

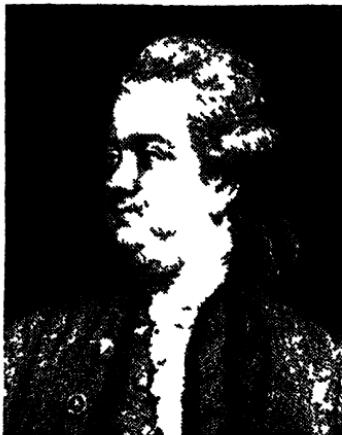
Gibara, well known Cuban seaport on the N coast of the prov. of Santiago de Cuba. It has a well fortified harbour and civil and military hospitals. Trades in fruit, corn, tobacco, coffee, sugar. It is a port of call for the Amer Hudson line. Pop. 7000.

Gibaros, see JIVAROS.

Gibbet, species of gallows erected near the scene of a crime on which the convicted criminal was suspended in chains after his execution by order of the courts of justice. The body thus hung, encased in an iron frame was supposed to serve as a public warning to terrorise the evil minded. This practice legalised in 1752, was abolished in 1834. It was the name of the highwayman in Farquhar's *Beaux Stratagem* who boasted himself as the best conducted man in his profession. See A. Hartshorne, *Hanging in Chains* 1891.

Gibbon, Edward (1737-1803) most celebrated of the Eng historians whose great work *The Decline and Fall of the Roman Empire* has placed him among the most celebrated of the world's historians. He was b at Putney, the eldest child of Edward G and Judith Porten who had five other sons and one daughter. The Gs. were an old Kentish family. The

historian's grandfather, Edward was an enterprising and very prosperous London merchant who lost a fortune in the South Sea Company's catastrophe, and built it up again by his extraordinary energy of character and his profound knowledge of commerce. His father was educated at Westminster and Cambridge, then became MP for Petersfield a mkt tn near Buriton in Hampshire where the estate was situated. His mother often in poor health and claimed by the social duties inseparable from her husband's position was reluctantly forced to yield up the care of her son in great part to her sister Catherine Porten to whom unflinching devotion & piety a tribute in his autobiography. He was in



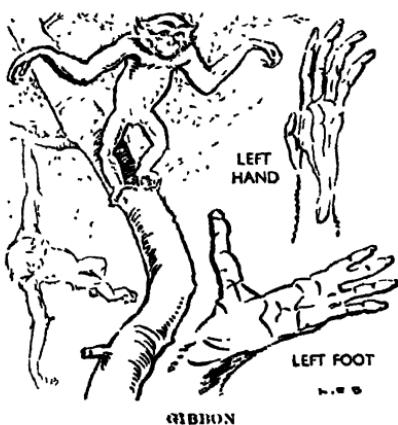
EDWARD GIBBON

Painting after a print by Sir R. Hayter

extremely delicate boy and his aunt nursed and watched him through the sicknesses to which he was a constant prey, educated him to; whence yet in interval of improvement health afforded the opportunity. At seven he received elementary in arithmetic. In 1743 he went to school at Kingston on Thames. His mother d in 1747 and after spending some months at Buriton, he went to Westminster School in 1748. He passed many hours in his grandfather's library at Putney, and here he developed an ardent love for reading. At school poor health caused his progress to be very slow. At use of treatment at Bath and at the house of a Winchester doctor proving futile the idea of education at school was given up and he was instructed henceforth intermittently by tutors. His love of reading hitherto indiscriminating, now led him into a preference for hist and when once interested in a subject of hist he devoured all he could find upon it. In every book to which he could gain access, not reading the book all through but

pursuing his subject into every hole and corner. Doubtless this instinctive 'method' laid the foundations of the clear-thinking and sense of proportion which enabled the future historian to mass the complicated materials of his vast picture. In his sixteenth year his health improved as if by miracle, his constitution became 'fortified and fixed,' and from that time onwards he was free from ailments. The same year (1752) he went to Oxford as a gentleman commoner of Magdalen College. Fourteen months of desultory reading and of gaiety, during which he read Bossuet and declared himself a Rom. Catholic, ended in his being expelled by an outraged univ. and sent by an angry father to Lausanne to the home of a Calvinist minister, M. Pavillard, 'there to be brought to a better way of thinking.' Under excellent guidance he here pursued a course of serious study, including the Lat. classics, Locke, Grotius, Montesquieu, and Pascal, together with logic and mathematics. During this period he renounced his Rom. Catholicism, had some intercourse with Voltaire, and fell in love with Mile Curchod; but, his father disapproving, he tells us: 'I sighed as a lover, I obeyed as a son, and the lady afterwards became the wife of Necker, the famous minister of Louis XVI.' Returning to England in 1758 he pub. In 1761 a little book in Fr., *Essai sur l'étude de la littérature* (an Eng. trans. appeared in 1764). After two years of 'military servitude' as captain in the Hampshire militia, he set out on the 'grand tour.' In Paris the intellectual world welcomed him, and happy days were spent in Switzerland, but Rome was his bourn. Here, amid the ruins of the Capitol, in 1764, he conceived the idea of writing the *Decline and Fall*. Hardly daring to attempt so vast a work, he contemplated his idea 'at an awful distance,' for some years working laboriously and honestly, studying original records, inscriptions, medals, etc. His father's death in 1770 leaving him independent, he settled in London, became M.P. for Liskeard in 1774, and accepted a gov. sinecure, which supplemented his income by about £800 a year. Losing this on a change of gov., he retired to Lausanne and settled there with his great friend Deyverdin. In 1776 the first vol. of the *Decline and Fall* was pub. The work aroused tremendous enthusiasm, and was sold out in a few days, a second, and then a third ed. becoming necessary. The next five years were wholly taken up with the gigantic labour of producing the succeeding vols. Vols. II. and III. appeared in 1787, and vols. IV., V., and VI. in 1788. (A. d. six years later, of a disease the existence of which he had hidden from his friends. G.'s *Decline and Fall* has borne the critical judgment of more than a century and a half without losing its place as one of the foremost historical works of all time. It is unsurpassed for its comprehensiveness, its wealth of information, general accuracy and well-weighed decisions, together with its stately diction and charm of narration. Innumerable details have

been made to yield up a 'philosophy of history' in the light of which characters, events, and conditions account for each other. The treatment varies according to necessity—here complicated details are analysed to their foundation and their underlying philosophy is extracted, there this philosophy is used to shed light on a period which, by its means, may be swept over rapidly; hampering details are cast aside, and the general trend of events stands out clearly. Defects there are, both of style and of judgment—gallantries creep in easily, the stateliness sometimes becomes monotonous rhythm, the remarkable clearness occasionally fails. Worst of all, the calm judgment is sometimes obscured where G.'s prejudices and preferences are involved. Religion had no interest for him, and the famous fifteenth and sixteenth chapters would no doubt have been more acceptable to the intellect had he not offended the feelings by disobeying his own 'great law of impartiality' and let his love for Rome lead him into sarcasm in dealing with the early Christianity which he makes responsible for her downfall. His other works include *Mémoires littéraires de la Grande Bretagne* (with Deyverdin, 2 vols., 1767, 1768); *Critical Observations on the Sixth Book of the Annal* (1770); *Vindication* (1779); *Antiquities of the House of Brunswick*, ed. by Lord Sheffield (1814); and *Memoirs of my Life and Writings*, ed. by Lord Sheffield, 2 vols. (1827). See Sir S. Walpole, *Essays and Biographies*, 1907; J. Smith, *Junius Unveiled*, 1909; E. Clodd, *Gibbon and Christianity*, 1916; L. Strachey, *Portraits in Miniature*, 1931; and E. Hutton, *The Conversion of Edward Gibbon*, 1932; also lives by H. H. Milman, 1839; G. Birkbeck Hill, 1900; D. M. Low, 1937; and G. M. Young, 1918.



Gibbon (*Hylobates*), the smallest of the anthropoid apes, rarely exceeding 3 ft. in height, is found principally in the Malay peninsula. The species include the hoolock (*H. hoolock*), a native of Assam, the

Choramodus, Harlan's G. (*H. concolor*) from Borneo, the white-handed G. (*H. lar*), a native of Malacca and Siam, and the Siamang (*H. syndactylus*). This last, found in Sumatra, is the largest of the group, black in colour with a large laryngeal pouch. The G.s. are noted for their agility in climbing, their slim contour and length of arm contributing to this facility. Their loud voices and howling cries resound through the woods, particularly in early morning. They are gregarious, very intelligent, and easily tamed when young. See ANTHROPOID APIES.

Gibbons, Grinling (1648-1721), celebrated wood-carver and sculptor, b. at Rotterdam. He was brought to the notice of Charles II. by Evelyn, the diarist, and became master carver in wood to the Crown until the time of George I. Many of the carvings in Windsor, Kensington, and Whitehall are by him. He carried out commissions for Sir Christopher Wren, including the choir stalls of St. Paul's, and woodwork in Trinity College, Cambridge. Chatsworth, Southwick, and Petworth (q.v.) were all beautified by his art. In sculpture he was scarcely less successful, as is evidenced by his monument to Newton in Westminster Abbey and the bronze statue of James II. in Whitehall. The ceiling of a room at Petworth is considered to be one of his masterpieces. He also designed the base of Charles I.'s statue at Charing Cross and that of Charles II. at the Royal Exchange in 1694; four statues, representing St. John, St. Peter, St. Paul, and the Church, in College Garden, Westminster, were identified as his work. G. was one of the most skilful craftsmen who has ever worked in this country, but some deny his claims to be considered a great artist, and consider his art to be 'still-life sculpture applied to the wall rather than carved decoration of the interior architecture' (Margaret Whinney). This may be exemplified by the complex carving of flowers and fruits at Hampton Court. Though Evelyn introduced G. to Sir Christopher Wren, and on his behalf 'bespoke His Majesty for his work at Windsor which Mr. May the architect there is going to alter and repair,' it was in fact in his association with Hugh May rather than with Wren that G. was to create the style by which he is remembered. It is not improbable that the first introduction to May had come through Lely, the painter, for it is certain that Lely, May, and G., with the help of Verrio, the Italian decorative painter, were responsible for the new baroque tendency which appeared in Eng. decoration in the late seventeenth century. Great changes were introduced by G. and May at Cassiobury Park (now destroyed) and at Windsor. The architectural decoration of the rooms largely disappeared; instead of the pilasters are pendants of fruit and flowers, and the overmantel becomes a series of small mouldings below a painting, which is also framed by naturalistic carving. It is surmised that G. was not quite so fitted to carry out commissions in sculpture, because he subsequently employed a series of

Flemish collaborators. Among his works in sculpture of the eighties the monument to Viscount Camdon at Exton is of no great merit; but the statue of Charles II. at Chelsea Hospital, and that of James II. (mentioned above) in Rom. armour, which stands in front of the National Gallery, are both fine pieces of sculpture. His great commission at this period was the altar for James II.'s Rom. chapel in Whitehall Palace, in which G. was assisted by the Flemish artist Artus Quellin. The finest work reputed to be by G. in St. Paul's Cathedral lies in the choir stalls and the great organ case, made during 1698 and 1697. The decorations in limewood with trumpets, scrolls, and flowers above the stalls and the boys supporting the bishop's mitre and the peacock in her piety are all evidently characteristic of the work of G. rather than of his collaborators. See H. A. Tipping, *Grinling Gibbons and the Woodwork of his Age*, 1914, and A. E. Bullock, *Grinling Gibbons and his Contemporaries*, 1914.

Gibbons, Orlando (1593-1625), Eng. musician and a celebrated composer of church music, b. at Cambridge. He took the degree of Mus. Doc. at Oxford in 1622, and was made organist of Westminster Abbey in the following year. He d. suddenly at Canterbury while waiting to take part in Charles I.'s marriage service, for which he had composed the music. Orlando G. marks the apotheosis of the anct. Eng. musical art and with him the old church school of England may be said to cease. His compositions are still in frequent use in the church services to-day. The most famous are *Morning and Evening Service* in h; anthems: *Hosanna, O Clap your Hands*, and *God is gone up*; madrigals: *The Sweet Swan* and *Dainty Sweet Bird*. He also composed some beautiful chamber music. See E. H. Fellowes, *O. Gibbons*, 1925.

Gibbs, Josiah Willard (1837-1903), Amer. physicist, b. at New Haven, Connecticut. From 1871 prof. of mathematical physics at Yale Univ. Although his scientific papers were not numerous all were important. His fame was made by a paper, pub. in the *Transactions of the Connecticut Academy*, 1875-78, and entitled 'On the Equilibrium of Heterogeneous Substances,' which led to the estab. of the 'phase rule' of chemical equilibrium and change. Other papers: *Graphical Methods in the Thermo-Dynamics of Fluids* (1873); *Methods of Geometrical Representation of the Thermo-Dynamic Properties of Substances by Means of Surfaces* (1873); and treatises on the electro-magnetic theory of light (1882-83) and on vapour densities. See W. L. Miller, *Method of Willard Gibbs in Thermodynamics*, 1925.

Gibelion, see BI-BIT, JIBRIN.

Gibello, Mount, see ETNA.

Gibeon, anct. city of Palestine, 5 m. N.W. of Jerusalem. The vil. of El-Jib now occupies the site, which is a solitary hill overlooking a corn valley. It is now chiefly remarkable for its springs, but in biblical hist. it is famous as the scene of the combat between the fighters of David and

those of Ishbosheth (2 Sam. ii. 12-32), of the murder of Amasa by Joab (*ibid.* xx. 8-10), and especially of the bloody battle in which Joshua overcame the five kings of the Amorites who were besieging the tn., because the inhab. had made a treacherous covenant with the enemy of all the Canaanites. The Gilbeonites had previously been brought into bondage by Joshua, that is, made 'hewers of wood and drawers of water unto all the congregation,' because they had won from him a truce by deceit and trickery (Joshua ix., x.).

Gibraltar (Moorish *Gebel-al-Tarik*, or *Jebel-el-Tarik*), Brit. strongly fortified tn. and promontory in extreme S. of Andalusia, Spain, forming the E. horn of the bay of Algeciras or G., N. of the strait of G. connecting the Atlantic and the Mediterranean Sea. G., as Mons Calpe, and Mt. Atyla (Apes' Hill) on the African coast opposite, were known to the ancients as the famous 'pillars of Heracles,' and considered by them to be the W. extremity of the world. The great promontory, of brownish-grey limestone or marble, is connected with the mainland by an isthmus of sand. It is shaped like an enormous lion, 3 m. long, averaging $\frac{1}{2}$ m. broad, reaching $\frac{1}{2}$ m. above sea level, except on the W., where it slopes more gently to the sea. Though barren in appearance its vegetation includes capers, asparagus, cacti, and aloes, and its fauna partridges, wood-pecks, pigeons, rabbits, and small monkeys (Barbary apes), the only native monkeys of Europe. There are numerous caverns and galleries cut out in the rock, the largest being St. Michael's, with a hall 230 ft. long. G. is in fact a labyrinth of tunnels, an underground city divided into many self-contained parts, and till tunneling goes on, to accommodate great power plants, hospitals, laundries, bakeries, kitchens, ammunition stores, lorries, gun emplacements, and living accommodation for thousands of men. The narrow ledges bristle with wireless masts and radar equipment. The Sp. lines are near the point of junction of the rock of G. and the mainland, the space between being called neutral ground. On the flat isthmus joining the rock to Spain is the aerodrome, extended into Algeciras Bay. The fine harbour has two moles, 1100 and 700 yds. long. There are a lighthouse and an important wireless station situated by Europa Point on the S. The tn. has two main divs., N. tn. and S. tn., while the part on which the lighthouse is situated is styled Europa. In the tn., however, are some slums, tawdry shops, and restaurants. Alameda Park is a moderate-sized garden in the central part of G., and the governor's house on the 'convent' is situated a mile away in the main street. There is an admiral's residence, an official house called The Mount on the Europa Road, half a mile S. of the gardens. The naval hospital is a mile away (but was closed for ten years or more). The theatre is half a mile N. of the gardens. There are also the exchange building and the barracks. G. is the see of an Anglican and a Rom. Catholic bishop. The Anglican cathedral or church

of the Holy Trinity is in the Moorish style. There are also Protestant and Rom. Catholic churches, Jewish synagogues, public schools, and libraries. A crown colony of Great Britain controlled by a governor, G. is of extreme importance as a coaling station and for its control of the Mediterranean Sea. It has been a free port since 1704, but, for revenue purposes, there are import duties on malt liquors, wine and spirits, tobacco, motor spirit, and perfume. Industries are of no importance, but there is a fair transit trade at the port and G. is becoming a popular tourist centre. There is cable communication with the Continent, Tangier, the Mediterranean E. ports, and England. The fortress was taken, A.D. 711, by the Saracen chief, Tarik ibn Ziad. The Moors finally ceded it to Spain, 1462. After 1500 it was extensively fortified by Charles V. In 1704 it was captured by the Eng. and Dutch under Rooke. It was subsequently often besieged by the Spaniards, notably 1779 &c., when it was gallantly defended by Heathfield against the united Fr. and Sp. It was ceded to Great Britain by the treaty of Utrecht in 1713, renewed by the treaty of Versailles in 1783. Since 1897 a new mole and enclosed deep harbour has been built at the N. end. In the Second World War, as in the First World War, G. was of paramount importance as a pivotal point of Britain's sea lines; for a successful thrust either at G. or at Suez or at both together would have meant her expulsion from the Mediterranean and jeep ridged her hold on the Middle E. On the other hand it may be that the Nazis in the Second World War hesitated to attack Spain for fear of dispersing their own resources over too extended an area without appreciably increasing them; besides which Spain would have been of little practical aid against G. Italy in 1942, with Italy in the war, it was questioned by many in Britain whether Malta could be held and whether it should even be attempted to be held. This was the school of thought which for some years had argued that, in case of war with Italy, it would be wisest to abandon the Mediterranean and to be content with sealing it at both ends through control of G. and Suez; and the arguments for this course had been reinforced by the collapse of France. Fortunately other counsels prevailed—strengthened by the amazingly successful defence of Malta. Again, in the late autumn of 1942 the Brit. command of the straits of G. prevented any serious interference with the Anglo-American expedition to N. Africa, whether by Axis submarines or by air patrols, when passing through the straits. Naturally, the bottle-neck at the straits invited a U-boat concentration in the surrounding area, but the most efficient organization for patrol and protection, which was rendered possible by the very fact of holding G., kept losses down to a low level in the first six months of 1943, when 11,000,000 gross tons of shipping was escorted by the R.N. into the ports of N. Africa. There was always a danger that the Ger. reply to the allied

invasion of N. Africa would be an invasion of Spain and the occupation of bases dominating the straits without opposition from Gen. Franco. But before the end of 1942 there were signs that doubts were beginning to influence the mind of Gen. Franco, for a move towards a firmer neutrality might be seen in overtures to Portugal for the formation of an Iberian bloc. The fixed civilian pop. was estimated in 1947 to be 21,200. The military pop. is about 3000; the naval pop. is approximately 550. The settled pop. are chiefly descendants of Sp. and It. settlers. See 'Memoir of Elliot' in Green's *Siege of Gibraltar*, 1784; J. Drinkwater, *History of the Siege of Gibraltar*, 1883; A. M.

Collier's Weekly, in which appeared the famous 'Education of Mr. Pipp,' G. essayed portraiture in oils, but eventually returned to his designs in pen and ink.

Gibson, Edmund (1669-1748), Eng. divine, who in 1692 brought out an improved Eng. trans. of Camden's *Britannica*. His great work was *Codex juris ecclesiastici Anglicani* (1713), written to plead the privileges of the Convocation.

Gibson, Edward, see ASHBOURNE, BARON.

Gibson, John (1790-1866), Welsh sculptor, b. at Glynllif, near Conway, son of a market gardener. For some years he worked in the studio of Cunova, and later became for a time the pupil of the Dano



E.N.A.

GIBRALTAR

Monti, *Historia de Gibraltar*, 1851; F. Sayer, *History of Gibraltar*, 1862; J. Manu, *History of Gibraltar*, 1870; H. Field, *Gibraltar*, 1889; E. R. Kingdon, *Gibraltar under Moor, Spaniard, and Briton*, 1935; G. T. Garratt, *Gibraltar and the Mediterranean*, 1939; Stetson Conn, *Gibraltar in British Diplomacy in the Eighteenth Century*, 1942; and R. Henfrey, *Journey to Gibraltar*, 1943.

Gibraltar, Strait of (anc. *Fretum Herculeum*), entrance from the Atlantic to the Mediterranean, having a length of 50 m. and a breadth varying from 9 to 23 m. It is flanked on the N. by Spain, on the S. by Morocco in Africa.

Gibson, Charles Dana (1867-1914), Amer. artist, b. at Roxbury, Massachusetts, son of Charles de Wolf G. Attended for one year the schools of the Art Students' League in New York, and first drew for the comic weekly *Life*. It was his portrayal of the Amer. girl, especially of an idealised type, in which health, refinement, and extreme dignity were suggested, that established his name and made magazines vie with one another for his drawings of what came to be known as the G. girl. After having made a fortune by contributing to

Thorwaldsen. But the old Gk. sculptors were his true masters, and their influence is reflected in his works. Thus it was Gk. mythology which supplied him with his subjects, 'Bacchante and Faun,' 'Amazon thrown from her Horse,' 'Proserpine,' 'Sappho and Psyche,' etc. It was the knowledge that Phidias and Praxiteles had coloured their statuary that suggested to him the tinting of his 'Venus' (1851) and other of his works, a process which was naturally regarded as a daring innovation. It was moreover in classical garb (the *Roma*, *toga*) that he insisted on representing Peel, whose fine statue now adorns Westminster Abbey, and Huskisson, whose colossal marble figure now stands in the cemetery of Liverpool. But the above are merely external illustrations of his paganism in art. In his *bassorilievi*, such as 'Hours leading the Horses of the Sun,' he shows the truly Gk. appreciation for the serenity and natural limits of the plastic art. Among his many imposing monumental works may be mentioned the group of Queen Victoria with Clemency and Justice in the Houses of Parliament. See T. Matthews, *J. Gibson*, 1911.

Gibson, Wilfrid Wilson (*b.* 1878), Brit. poet. Was for a time a social worker in the E. end of London, and during the First World War he served in the ranks. These experiences form the background of much of his work. Most of his poems — notably the seventeen dramatic pieces which make up *Daily Bread* (1910) and the work *Livelhood* (1917) — present the normal toiling life of man in our modern industrial world. The talk and thoughts of the factory folk are modulated into verse, in which the figures are significant rather than symbolical, and in which the poignant experience, when it finds a place, is uttered in the heroic and non-sentimental strain. There is nearly always a story even in his shortest pieces, and the story is generally full of interest. G. is one of the so-called neo-Georgians, who, as has been well said, did at least stir the public to read poetry before the First World War came to throw men back on the elemental emotions, which can be expressed only in poetry. Though he chooses unlovely themes, the ugliness of the hand-to-mouth existence, he is certainly the laureate of modern industrialism' (A. C. Ward) who sings of a man-made hell of machines and creatures of the machines in verse which creates the illusion of the glare of furnaces and the grim and muck of industry. Some of the most striking of his individual pieces are *Kindestrike*, *Flannan Isle*, and *The Ice-cart*. His poems include, besides those mentioned, *Stonefolds* (1907); *Fires* (1912); *Thoroughfares* (1914); *Borderlands* (1914); *Battle* (1915); *Friends* (1916); *Whin* (1918); *Hone* (1920); *Neighbours* (1920); *I Heard a Sailor* (1925); *Collected Poems, 1905-25* (1926); *The Golden Room* (1928); *Hazards* (1930); *Highland Dawn* (1932); *Fuel* (1931); *Coming and Going* (1938); *The Herl* (1941); *Challenge* (1942); *The Searchlights* (1943); and *The Outpost* (1944). See also E. M. (Sir Edward) Marsh (ed.), *Georgian Poetry*, 1911-12.

Giddings, Joshua Reed (*b.* 1795-1861), Amer. statesman, sat from 1833 to 1839 in the national House of Representatives, first as a Whig, later as a Free-soiler, and eventually as a Republican. The abolition of slavery was very materially assisted by his able and outspoken speeches. When the slaves of the Creole slew their captain and claimed their liberty (1841) he courageously asserted that in 'resuming their natural rights to liberty' they 'violated no law of the U.S.A.' In 1842, when Congress passed a vote of censure on him, he resigned his seat, but his immediate re-election proved that the public fully recognised the value of his disinterested and splendid work.

Gide, André Paul Guillaume (*b.* 1869), Fr. novelist and critic, *b.* in Paris. Educated at Ecole Alsacienne and Lycée Henri IV. At one time conducted *La Nouvelle Revue Française*. His outstanding work is *Les Faux-Monnayeurs* (1925), his one roman, which marks the climax of the Proust period; but it is a barely readable work evidently aimed at the 'counterfeit' imitations of Proust, and the writing soon afterwards of *Le Journal*

des faux-monnayeurs (1926) admits, by implication, that the former work was a failure. A great Fr. writer, G. began in a vein of turgid romanticism veiled as symbolism; but *Le Voyage d'Urzen* (1893), *Les Nourritures terrestres* (1897), and *L'Immoraliste* (1902) would have been ignored but for the soundness of their ideas and sentiment and for the promise which was to develop much later in *Se le grain ne meurt* (1921). *Les Caves du Vatican* (1914) is a fantastic tale which seems to exploit the moral theory of acts without motive, a paradox exemplified also in the work *L'Acte gratuit* (a tale of homicide without reason), the former of which, says Prof. Denis Saurat, would have been a masterpiece had it been possible not to take it seriously. A remarkably different outlook seems to pervade his two delightful travel books, *Voyage au Congo* (1928) and *Retour du Tchad* (1929), books completely antithetical to the spirit which seems to inform his 'inertiveless' stories. The substance of G.'s writings is, all through, his own self, a *moi* which has not achieved any cohesion and yet up to a point seems to reflect everybody's outlook. What he seems to be driving at in his more complex works is that sincerity is the prime virtue but consists in having no fixed beliefs. But above all G. is a supreme stylist, as may be seen in his autobiographical *Si le grain ne meurt* and his *Journal* (1939) and the two African travel books, and many Fr. critics hold that he is the greatest modern writer of Fr., not excepting even Paul Valéry. His *Journal* will probably remain his most read work. Some of the numerous themes which recur most frequently in it include his home at Cuverville, travel, piano-playing, Racine, Dostoevsky, homosexuality, his wife, the Gospels, the devil, Browning, insomnia, temptation, the problem of style, animals, Pascal, health, Conrad, and Bosuet. It is so summary a list serves to afford some indication of G.'s main preoccupations. It also indicates the peculiar rhythm of his existence, in perpetual oscillation between discipline and anarchy, between classicism and revolt, between austerity and sensuality. What is significant in G. and emphasises his originality as a writer is that he has no wish to suppress any of these extremes, nor to decide between the alternatives suggested to him by his own nature. He is equally attracted by heaven and hell, and is disposed to think that the kingdom of God partakes of both, particularly because, as the Gospel text teaches which he quotes so often, that kingdom is within you. His other works include *Les Cahiers d'André Walter* (1891); *Les Poésies d'André Walter* (1892); *La Tentatrice Amoureuse* (1893); *Paludes* (1895); *Le Prométhée mal enchaîné* and *Philoctète* (1899); *Lettres à Angèle, 1898-99* (1900); *Le Roi Candaule* (drama) (1901); *Saül* (drama) and *Prélèvements* (1903); *Amyntas* (1906); *Le Retour de l'enfant prodigue* (1907); *Dostoevsky d'après sa correspondance* (1908); *La Porte étroite* (1909); *Oscar Wilde* (1910); *Nouveaux Prélèvements* and *Isabelle* (1911);

Bethsabé (1912); *La Symphonie pastorale* (1919); *Corydon* (1920); *Nunquid et tu . . .?* (1922); *Incidences* (1924); *Caractères* (1925); *Dindiki and Faïta* divers (1928). See S. Braak, A. Gide et l'âme moderne, 1923; C. du Bos, *Le Dialogue avec André Gide*, 1929; R. Fernandez, André Gide, 1931; L. Pierro-Quint, André Gide: sa vie, son œuvre, 1932; Klaus Mann, André Gide and the Crisis of Modern Thought, 1945; and *The Journals of André Gide*, trans. by Justin O'Brien, vol. I, 1889-1913, 1947; vol. II, 1914-1927, 1948.

Gide, Charles (1847-1932), Fr. political economist; b. at Uzès (Gard). Prof at univ. of Paris, 1898-1920. Early became attached to Christian Socialist movement. Works include *Principes d'économie politique* (1884); *La Coopération* (1900); *Histoire des doctrines économiques* (with Charles Riut) (1909); *Premiers notions d'économie politique* (1921); and *La Coopération à ses colonies communistes et coopératives* (1930).

Gideon, warrior judge of Israel, won the title of Jerubbaba ("Let Baal plead") for destroying the heathen god's altar at Ophrah, his bp., and seems in his youth to have tried to rouse the people from their idolatry and sloth. But his great achievement was to overwhelm the Midianites at the bloody battle near Mt. Gilboa. These people were continually making inroads for rapine, and G. believed that Jehovah had directly inspired him to lead the chosen people against them. The fruits of this struggle were a peace of forty years. The higher biblical criticism has revealed the fact that the G. story is inconsistent, and probably a coloured and dramatic version of what actually occurred.

Gielgud, Arthur John (b. 1904), Eng. actor, b. in London, April 11. His father, Frank G., was a member of a Polish family which had settled in England some years previously. On his mother's side he is connected with the celebrated theatrical family the Terrys (q.v.). His mother was a daughter of Kato Terry and a niece of Ellen Terry. G. was educated at Westminster School, and deciding on a stage career he then studied at Lady Benson's school, gaining from there a scholarship to the Royal Academy of Dramatic Art. His first appearance on the stage was in 1921 at the Old Vic Theatre as the herald in *Henry V*. For the next few years he played a great variety of roles in a succession of plays. Early in 1928 he visited New York, playing at the Majestic Theatre in *The Patriot*, in which he took the part of the Grand Duke Alexander. In 1929 he was again with the Old Vic Company, playing a number of Shakespearean roles, including Hamlet and Macbeth. The following year he played Hamlet at the Queen's Theatre and also John Worthing in Wilde's *The Importance of Being Earnest*. With these two roles he assured his reputation as one of the leading actors in the country. He then scored a big success with his production of *Richard of Bordeaux*, in which he played the title role. The play ran for two years. In 1934 he

again played Hamlet in his own production, which was marked by a very successful run. Two years later he continued his success in Hamlet during a second run in New York. In 1939 he was at the Lyceum Theatre, also as Hamlet, which he played with the Old Vic Company at Elsinore on the outbreak of war. During the war years he toured in plays for the army and the R.A.F. in the United Kingdom, Malta, and Gibraltar. In London he produced Barrie's *Dear Brutus*, in which he played Will Dearth (1941). In 1944 he formed his own company for a season of repertory at the Haymarket Theatre, playing Hamlet, Valentine in *Lore for Lore*, Oberon in *Midsummer Night's Dream*, and Ferdinand in *The Duchess of Malfi*. In 1945 he travelled in Burma, playing in *Hamlet* and Coward's *Blithe Spirit*. He has also appeared in films, notably in *The Good Companions* (1932) and as Disraeli in *The Prime Minister* (1940). An autobiography of his early years is contained in *Early Stages* (1939, 1949).

Gien, tn. of the dept. of Loiret, on the R. Loire, France. It has porcelain manufcts. The tn. was severely damaged in the Second World War. Pop. 8290.

Giesebeck, Friedrich Wilhelm Bonnamin von (1814-89), Ger. historian, held the chair of hist. both at Königsberg (appointed 1857) and at Munich (1863), and left behind him a long series of historical works. Of these the most valuable and exhaustive is his *Geschichte der deutschen Kaiserzeit* (1855-94), which treats of no events later than 1811. A trans. of Gregory of Tours (1851), *Deutsche Reden* (1851), and *Arnold von Brescia* (1873) are his publs. See Lord Acton, *English Historical Review*, vol. v, 1890.

Giesecke, Johann Karl Ludwig (1793-1854), Ger. writer on church hist., graduated in philosophy from Halle in 1817. In 1819 he was appointed to the chair of theology at Bonn as the result of his *Entstehung und die frühesten Schicksale der schriftlichen Erangelie*, wherein he disproved the existence of a primitive written gospel. In 1831 he accepted a similar position at Göttingen. His *magnum opus* is his *Lehrbuch der Kirchengeschichte* (5 vols., 1824-57). In this work he gives the world the benefit of his profound learning and carefully sifted information, and may not unfairly be associated with Neander, though he could not grasp with the same intensity the fullness of the spiritual life of Christian churches.

Giesen, tn. of Hessen, Germany, 16 m. s. w. of Marburg, connected by rail with Kassel, Koblenz, and Cologne. Situated amid picturesque surroundings at the confluence of the Lahm and Wieser, it has a univ. (founded in 1607), whose chemical laboratory was the scene of the valuable researches of Liebig (1824-52); and has manufcts. of woolen and cotton goods, leather, tobacco, machinery, etc. Pop. 36,000.

Giffard, Godfrey (c. 1235-1302), bishop of Worcester and chancellor of England, son of Hugh G., of Boyton, Wiltshire, a

royal justice, and younger brother of Walter G. (q.v.), to whom he owed advancement. Became canon of Wells and rector of Melis; archdeacon of Barnstaple (1265-67). Walter, becoming chancellor, made Godfrey chancellor of the Exchequer, 1266. The same year Godfrey succeeded to the chancellorship of England, archdeacon of York and rector of Adlingfleet (1267); became bishop of Worcester (1268), and soon afterwards resigned chancellorship, though still often employed on state business.

Giffard, Hardinge Stanley, see Halsbury, Earl of.

Giffard, Walter (d. 1279), archbishop of York; b. probably before 1235, elder brother of Godfrey G. (q.v.). Became canon and archdeacon of Wells. Bishop of Bath and Wells, 1261. Made chancellor of England after battle of Evesham. Pope Clement IV. appointed him archbishop of York, 1266, and he resigned chancellorship. G. received great seal on death of Henry III., was principal of the three governing England till new king's arrival (1271), and one of the guardians of England during Edward I.'s absence in 1275.

Giffen, Sir Robert (1834-1910), Brit. statistician and writer on finance. From 1856 dates his association with the Board of Trade, where he served as chief statistician, assistant secretary (1882), and controller-general (1892-97). His chief publs. were *Essays on Finance* (1879, 1881); *The Growth of Capital* (1890); and *Economic Inquiries and Studies* (1904).

Gifford, William (1757-1826), Eng. political writer and man of letters. Early left an orphan, but was rescued from a "state of savage melancholy" by Coolsley, a local surgeon, who sent him to school and afterwards to Oxford. His ability and sad story persuaded Lord Grosvenor to appoint him tutor to his son and to afford G. his home as an asylum (1782). From this time forth G. devoted himself to writing. His *Bariad* (1794) and *Mardon* (1795) were powerful satires directed against the Della Cruscans of Florence, and the inaptitudes and corruption of modern dramas respectively. In politics he was an enthusiastic admirer of Pitt, a good hater of the Fr., and a bitter opponent of Radical principles. Among his illustrious associates were Pitt, Canning, Ficke, and the marquess of Wellesley. G. was the first editor of the *Quarterly Review*, with which he was connected from 1809 to 1824, but though by his vigorous political partisanship he secured for it an ever-increasing circulation, he nevertheless blackened its pages with a cruel and prejudiced attack on Keats's *Endymion* and many similar onslaughts on the writings of Shelley, Lamb, Hazlitt, and others. See R. B. Clark, W. Gifford, *Tory Satirist, Critic, and Editor*. 1930; also Hazlitt's open letter to him, and his short autobiography (1827).

Gift, transfer of property without valuable consideration (q.v.) to a person who accepts the property either by himself or through his trustee. To constitute a G. there must be both a complete

transfer and an intention to give. As to what amounts to the former, much depends on the nature of the property. Such a movable chattel as a bicycle would require no more than delivery accompanied, as the law says, by *verbis de praesenti doni* (i.e. by words indicating that a G. is made). The transfer need not, however, be to the person intended to be benefited, but may be to a trustee for the benefit of the donee. A donee is not bound to accept a G., but if the G. be made by deed it vests in the donee without acceptance until he repudiates it. A promise to make a G. in the future gives no right whatever. An infant may accept a G. and repudiate it on attaining twenty-one. A *dowdio mortis causa* is a G. made by a man in contemplation of his death from an existing illness. Following the principles of the civil law (q.v.), the law is that a "death-bed G." is made only on condition that the thing shall be returned if the donor recovers, and that it is revoked by the predecease of the donee. A *dowdio mortis causa* is ineffectual without delivery, either to the donee or some one on his behalf. It appears to be settled law that bank shares, railway stock, consols, and building society shares cannot be the subject of a *dowdio mortis causa*, and cheques given must be cashed or negotiated before the donor dies. Delivery of the key of a safe would be effectual to pass securities in the safe.

Gifu, tn. of Japan, manufacturing silk and paper goods, near Lake Biwa, on the Central Railway in the *ken* or gov. of Central Nippon, of which it is the cap. Pop. 45,000.

Giga, more commonly called **Gigas**, was originally always a sprightly dance measure in , or 4 time, being often introduced into the suites of Bach and other old masters. It has also been used by Bach and Handel to finish a suite, and then simple time is sometimes found. "Jig" is in Irish *jig*, is another form of .

Giggleswick, par. and vil. in the W. Riding of Yorkshire, 16 m. N.W. of Skipton; known chiefly for its public school, founded in 1512. Pop. 800.

Gigli, Beniamino (b. 1890), It. operatic tenor, b. and educated at Recanati, his father, a shoemaker, being the sacristan of the cathedral there. At the age of seven he joined the cathedral choir. He failed to secure admission to the Schola Cantorum of the St-Simeon Chapel, but won a scholarship to what is now the Conservatorio di S. Cecilia, and studied music at the conservatory in Rome under Prof. Enrico Rosati. He made his début on the operatic stage at Rovigo, near Venice, in 1914 in the part of Ezio in Ponchielli's *La Gioconda*. He then toured the chief It. cities and also sang in Paris, Berlin, Madrid, and elsewhere in Europe. In Monte Carlo in 1917 he created the part of Ruggiero in Puccini's *Rondine*. He also sang at the Scala in Milan, where he established his reputation as one of the best tenors of the day. In 1920 he went to New York as a member of the Metropolitan Opera Company, and made his début there on Nov. 17 of that

year as Faust in a revival of Boito's *Mefistofele*. He remained with the Metropolitan Opera until 1932 singing in French. His opera among his outstanding roles being that of Mello in Lalo's *Le Roi d'Yver* and of Walter in Catalani's *Lordel*. He has also sung at Covent Garden and in opera houses of Budapest, Vienna



GILA MONSTER

Hamburg, Munich and Zurich. As a concert artist he has given recitals in most of the large cities of Europe, the USA and Australia.

Gijon, a port on the bay of Biscay, 11 m. N.E. of Oviedo in the prov. of Oviedo in Spain. When in 1551 the town was connected by rail with Langreo it became a coal mining centre and with Aviles and Oviedo the foundation of its present commercial prosperity was laid. Its exports, including iron, copper, zinc, fish and agave produce amount to about £120,000 annually, its imports which consist chiefly of machinery, timber and food stuffs amount to about £60,000. Moreover G. has its own blast furnaces, glass, tobacco and china factories and petroleum refineries besides the finest harbour between Santander and Madrid. Charles V made the first quay (1524) and since his day it has been many times reconstructed. The old town is perched on the promontory of Santa Catalina, the modern portion covering the slope between the two Torres and San Lorenzo. The bull ring in the latter quarter accommodates 10,000 spectators. Pop. 57,000.

Gila Monster, popular name for the poisonous lizard called *Heloderma suspectum*, which frequents the sandy wastes of Arizona, Texas and New Mexico. Its colour is bright orange and black and its victims are chiefly birds and small animals.

Gilbert, Sir Alfred (1851-1934), British sculptor and writer, son of Alfred Gilbert, Cavalier at the *Collège des Beaux Arts* in Paris and also in the studio of Sir Auguste Bartholdi, P.A. At Rome and Florence he was an enthusiastic admirer of the masterpieces in the galleries of sculpture, and his admiration is reflected in his 'Mother and Child' and 'Perseus Arming,' which were

assuredly inspired by Renaissance work. His 'Icarus' attracted much attention in the Royal Academy exhibition of 1884 but of his work known to the general public the most highly appreciated is the Shaftesbury memorial fountain ('Icarus') (1885) in Piccadilly, London. G. also executed the statue of Queen Victoria at Winchester (1908), the memorial to the Duke of Clarence, and fine busts of G. I. Watts, Sir Henry Tate, and many others. Received Brit. Sculptors Society gold medal 1926. See Sir J. Hatton, *Life and Work of Alfred Gilbert* 1903, and Isabel McAllister, *Alfred Gilbert* 1929.

Gilbert, Cass (1819-1934), Amer. architect b. at Zanesville, Ohio, son of Gen. Samuel Augustus G. Studied common school, Zanesville, St Paul and Mass. Institute of Technology, LL.D. of Univ. of Michigan and Oberlin and Middlebury Colleges. Beg. in practice in 1853. Is noted for his sculptures especially the Woolworth Building, New York (see ARCHITECTURE). He was architect of the Capitol and other buildings at St Paul, Essex Co. Court House, Newark, New Jersey, Arctic Building, Omaha Exposition 1890, U.S. Custom House, New York, Crystal Hall, St Louis Exposition, Central Public Library, St. Louis, Detroit Public Library, general plan of Univ. of Minnesota, Univ. of Iowa, and completion of Arkansas Capitol at Little Rock, U.S.A., Treasury Annex, Washington D.C., W. Virginia.



SIR HUMPHREY GILBERT

State Capitol, U.S.A., Chamber of Commerce. Appointed by President Roosevelt chairwoman of Council of Fine Arts by President Taft, member of the Commission of Fine Arts, reappointed by President Wilson, President Amer. Institute of Architects 1908-9, president National Academy of Design, 1926-27. See also ARCHITECTURE.

Gilbert, Sir Humphrey (c. 1539-83) Eng. navigator, was educated at Eton and

Oxford, and had served as a soldier in Ireland and the Netherlands, been in Parliament, and pub. his famous *Discourse on a North-West Passage to India* (1576) before he finally obtained his much-coveted patent from the queen to 'discover and possess' remote 'heathen lands not actually possessed of any Christian prince or people.' The immediate result of this charter was the fruitless expedition of 1578-79, when Raleigh sailed in his company. In 1583 he fitted out another fleet, formally occupied Newfoundland, where he landed in Elizabeth's name, and having planted the first Eng. colony, was on his way home when the little frigate, the *Squirrel*, in which he insisted on sailing, capsized, and the *Golden Hind* was left to carry home the tidings of their leader's untimely death. See life by D. B. Chidsey, 1932.

Gilbert, Sir John (1817-97), Eng. painter, sketched and drew from his earliest childhood, and seems chiefly to have been his own teacher, for his only lessons in art were received from Lance, the fruit painter. He exhibited at the Royal Academy from 1838, beginning with the 'Portrait of a Gentleman,' and continuing, except between 1851 and 1867, till his death to exhibit there a number of his best paintings, such as 'Don Quixote's First Interview with the Duke and Duchess' (1842), 'Holbein painting the Portrait of Anne Boleyn' (1842); 'Charles-magne visiting the Schools' (1846); 'Rembrandt' (1867); and 'Naseby' (1873), this being one of the most splendid of his designs. Two hundred and seventy of his water-colours were hung from 1852 onward in the gallery of the Old Water Colour Society, of which he became president in 1871. The success moreover of the *Illustrated London News* is said to have been due not a little to his engravings. Nearly all his subjects are historical, and a breadth of style, a vigour of conception, and a rich and harmonious coloration characterise his work. A few of his other works are 'Don Quixote and Sancho Panza' (1841); 'Richard II. resigning his Crown' (at Liverpool); and 'Morning of Agincourt.'

Gilbert, Sir John Thomas (1829-98), founder of the Public Record Office in Dublin, was for many years (1855-80) in charge of the library of the Royal Irish Academy, an office which he found very congenial, as it gave him every facility for satisfying his passion for hist. and antiquities. He ed. the civic records of his bp., Dublin, as far back as 1730, and was the author of *Historical Essays on Ireland* (1851); *History of Dublin* (1854-59); and *Contemporary History of Affairs in Ireland, 1641-1642* (1880). See life by his wife, 1905.

Gilbert, William (c. 1540-1603), father of the science of magnetism, studied in Cambridge and Italy, and about 1573 was admitted to the College of Physicians in London. Queen Elizabeth made him her physician-in-ordinary, but his fame rests on a far more substantial basis than royal favour, for in 1600 he pub. his exhaustive and original treatise on magnetism, viz. *De magnete, magneticisque corporibus, et*

de magno magnete tellure, a work which earned him the admiration of Galileo and an encomium from Erasmus containing the words (he is) 'great to a degree that is enviable.' In his realisation of the affinity and essential difference of magnetism and electricity, and of the communicability of telluric magnetism, in his fine conception of the whole earth as a great magnet influencing the direction of the magnetic needle N. and S., and his invention of terms 'electric emanations' and 'electric attractions,' etc., he may be said to have established all the 'fundamental facts' of his science. See the Eng. trans. of *De Magnetis* by S. P. Thompson, 1900.

Gilbert, Sir William Schwenck (1836-1911), Eng. humorist and playwright, was the son of a novelist, and a descendant of Sir Humphrey (i.), the explorer. His schooling was received in Boulogne and Faling, and in 1856 he graduated from King's College as a B.A. of the univ. of London. For four years (1857-61) he led a clerk's life in the education dept. of the Privy Council, but finding such an existence too slow decided to follow law, and was called to the Bar in 1864. From this time onward his time was largely occupied with all manner of literary activities, though he found time to serve as magistrate for Middlesex (1891), and to hold a captaincy in the volunteers. For many years after 1861 G. was a popular contributor of comic verse and illustrations, signed 'Bob,' to *Fun*, and his *Bob Ballads* which appeared in 1869, were merely a collection of his contributions. These lyrics, together with *More Bob Ballads* and *Songs of a Savoyard*, are full of splendid nonsense and of graceful whimsicalities. For some time G. acted as dramatic critic for the *Illustrated Times*, and it was his work on this paper which turned his attention to the stage. From 1866, the year of his success with a burlesque entitled *Dulcamara*, he continued to write original plays, among them being a clever fairy play entitled *The Palace of Truth* (1870); *Pygmalion and Galatea*, a mythological comedy (1871); *Sweethearts* (1874); and *Dan'l Druse* (1876). *Foggerty's Fairy and other Stories* is the best collection of his tales, most of which first appeared in magazine form. His famous partnership with Sir Arthur Sullivan dates from 1871. At first at the Royalty, and later at the Savoy, under the management of Richard D'Oyly Carte, there appeared in rapid succession a series of delightful operas, of which G. was the librettist, the most popular of them being *H.M.S. Pinafore* (1878); *The Pirates of Penzance* (1880); *Patience* (1881); *Iolanthe* (1882); *The Mikado* (perhaps the masterpiece, 1885); *Ruddigore* (1887); *The Gondoliers* (1889); and *The Yeoman of the Guard* (1888), the last-named undoubtedly containing some episodes of true poetry. These operas are one and all animated by a rich vein of humour which consists in 'a logical topsy-turvydom,' and of sly hits at the follies and foibles of the day, the satire being of such a disarming urbanity as to be free from all the odium which usually attaches itself to satirists. See

Edith A. Browne, W. S. Gilbert, 1907, and F. Cellier and C. Bridgeman, *Gilbert and Sullivan and their Operas*, 1914.

Gilbert and Ellice Islands, Brit. colony on the W. Pacific, comprising some three main groups of is. scattered in the form roughly of a triangle, the approximate geographical positions of whose vertices are N. (Gilbert Is.) 30° N., 173° E.; E. (Phoenix Is.) 4° S., 171° W.; S. (Ellice Is.) 11° S., 179° E. The colony comprises the Gilbert Is. proper; the Ellice Is.; Ocean Is.; the Phoenix group; and, away to the E., and immediately to the S. of Hawaii, the three detached is. of Washington, Fanning, and Christmas. The colony was built up gradually between 1877 and 1937; while, since 1939, two of the atolls of the Phoenix group (pop. 850), Canton and Enderbury, have formed an Anglo-Amer. condominium, the value of the is. being enhanced in these days of trans-Pacific air travel. With the sole exception of Ocean Is. all the is. are coral atolls, which explains their relatively tiny land area of 400 sq. m. in relation to the vast area of sea over which the groups are scattered (2,000,000 sq. m.). Christmas Is. occupies about half the land area. Ocean Is. or Banaba, lying about 250 m. from the Gilbert group proper (1500 ac.), is the headquarters of the gov. and the site of the Brit. Phosphate Commission. It is 280 ft. high and covered with vegetation (pop. 280). The total pop. of the G. and E. I. is only 36,000 and consists of Micronesians and Polynesians. The pop. of the Gilbert Is. in 1945 was 28,100; that of the Ellice Is., 3500. The Gilbertese are Micronesians, as are the Ocean islanders, while the Ellice islanders are Polynesian. The Gilbertese are inclined to be reserved, but the Ellice islanders are probably the most vivacious of all Polynesians. Life is very austere on these is., for, apart from the coco-nut and pandanus, nothing grows easily, though a coarse turner, the 'babai' (*Xanthosoma sagittifolium*), is cultivated in rock-sand pits. Politically the Gilbertese and Ellice islanders are remarkably advanced for primitive peoples, having evolved for themselves a sound form of self-government, with native magistrates and headmen (*kaubure* in Gilbertese and *suapule* in Ellice). There are also in each is. a chief *kaubure*, a native serjeant, and a local police force. Each council or 'native gov.' makes its own local regulations subject to the approval of the district officer (Brit.) and criticises the draft laws of the colony administered by the local courts before they are sent to the high commissioner for enactment as ordinances. Formerly in the Gilbert Is. there were some northerly is. which were outside this politic system. They were Little Makin and But (Great) Makin, where reigned a dynasty of high chiefs. A vivid description of the bloody rule of the last kings of the Makins is given in R. L. Stevenson's *In the South Seas*, as also a graphic picture of King Teni Binoka, of Abemama Is. where Stevenson lived for some time. It is surmised that the first white man to sight the Gilberts

was Mendala when he discovered the Solomon Is. (q.v.). But the official discoverers of the G. and E. I. were various Brit. naval officers who sailed these waters between 1764 and 1924. Among them were Capts. Gilbert and Marshall, after whom groups of is. are named. One is. of the Gilberts was named after Commodore Byron, who discovered the is. in 1785. Unfortunately the impact of the white man on the life of the islanders was often disastrous; the friendly and tractable Ellice islanders in particular fell an easy prey to the sordid 'blackbirders,' who snatched them away to toil and perish in the plantations of Mexico and Guatemala, while the white man's diseases thus introduced took terrible toll of those whom the kidnappers had left behind. At this early period some of the atolls were controlled by wandering white sailors and traders, others by missionaries; some by the 'native govs.' and high chiefs. Hence to evolve order out of this chaos the two groups were brought in 1877 under the jurisdiction of the high commissioner for the W. Pacific. Subsequently they became a separate entity by the proclamation of a Brit. protectorate over the Gilbert Is. at Abemama, May 1892, and over the Ellice Is. four months later. The protectorate was extended to Ocean Is. in 1900. So acceptable did Brit. rule prove to the natives that it was not long before the 'native govs.' expressed the wish to be formally incorporated in the Brit. Empire. The G. and E. groups of is. were annexed in 1915 and with Ocean, Fanning and Washington Is. were constituted into the G. and E. I. colony in 1916. Christmas Is. was included in 1919 and the Phoenix group in 1937. The pop. of the whole colony is steadily increasing and it was to meet a deteriorating economic situation that the Phoenix Is., previously only intermittently inhabited though claimed by Britain, were formally incorporated in the colony. On them numbers of Gilbertese have been successfully settled. Both the Gilbertese and the Ellice islanders are gifted and artistic people, who find their highest form of self-expression in dancing. They are Christians and literate, and their villages are often of impressive dimensions. See Sir H. Luke, *Britain and the South Seas*, 1945.

Gilbey, Sir Walter, Bart. (1831-1914), wine merchant, b. at Bishop's Stortford, Hertfordshire. He volunteered for civilian service in the Crimea, and after his return founded the well-known firm of wine merchants, W. and A. Gilbey. His spare time was devoted to the improvement of the breeds of Eng. horses, on which subject he wrote some standard works. He was president of the Royal Agric. Society in 1885. His writings include *History of the Great Horse or War Horse* (1888); *Ponies Past and Present* (1900); *Horse Breeding in England and India* (1901); *Modern Carriages* (1904); *Farm Stock One Hundred Years Ago* (1910) etc., and a vol. on agriculture from George III. to George V., *The Royal Family and Farming* (1911).

Gil Blas, see under LE SAGE, ALAIN RENÉ.

Gibboa (corruption probably of Hob, *Gib'ath habba'al*, hill of Baal), chain of hills in Palestine between the plains of Esdraelon and the valley of the Jordan, now called *Jebel Fukha*. Famous for being the scene of the death of King Saul and his three sons after the Philistines had defeated them.

Gild, see GUILDS.

Gildas, or Gildus (c. 516-70), early Eng. historian about whom little is known. He was surnamed *Sapiens* and also *Badianicus* from the battle of Mt. Budon, fought between the Saxons and the Britons. Our sole knowledge of hist. during the fifth century is derived from his treatise, *De excidio Britanniae*, pub. by Polydore Vergil in 1525 and trans. into Eng. by Habington (1638).

Gilder, Richard Watson (1811-1909), Amer. poet and editor, b. at Bordentown, New Jersey. He served as a private during the civil war. Entering journalism he founded the *Newark Register* with Newton Crane, becoming subsequently assistant editor of *Scribler's Monthly* and editor-in-chief of the *Century Magazine* after Dr. Holland (1904). He was one of the founders of the International Copyright League, and took an active interest in all public affairs. Chief works: *The New Day* (1875); *Lyrics, The Celestial Passion, The Great Remembrance, Two Worlds* (collected in *Five Books of Songs*, 1894); *Poems and Inscriptions, Letters and Speeches, of A. Lincoln* (1901); *In the Heights* (1905); and *Collected Poems* (1908).

Gilding, art of covering surfaces with gold by mechanical or chemical means for ornamental purposes. According to Herodotus and Pliny the custom was in use among the anc. Egyptians and also the Romans after the siege of Carthage. The thickness of the gold leaf was employed accounts for the comparatively solid traces extant. The art is seen to perfection in the native processes still pursued in India. G. in modern days is widely employed. The various processes used are as follows: (1) Leaf-gilding in which pieces of gold leaf are applied to the surfaces by hand and with adhesives. This is the method employed in church and interior decoration, and also by the shopkeeper, picture-frame maker, and the book-binder, though the latter uses heat or pressure, or both, as well. (2) The application of finely divided gold powder instead of leaf is used extensively in the decoration of glass, pottery, and porcelain. (3) Chemical or electro-chemical deposition. In this process the plating is effected by depositing the gold from solution by means of the electric current generated by dynamo or battery. The articles to be gilded are first washed free from grease, those of Britannia metal, tin, zinc, lead, or powder being given a thin preliminary film of copper or brass before immersion in the gold solution. This may be prepared in two ways: (1) Electrodes composed of gold sheets are hung by means of platinum wires in a hot solution of potassium cyanide and connected up to

a special dynamo or battery. (2) By dissolving the cyanides of gold and potassium in distilled water. The articles are hung in this solution or, if of small size, are supported in a perforated stoneware carrier. The anode is formed by a gold plate larger in area than the surface of the articles to be plated. The latter are connected with the negative pole of the battery or dynamo. The plating solution is frequently agitated while the process is being carried out and is kept at a temp. of about 110° F. It is probable that some of the new methods used in coating metals, such as the Sherardising process, may be successfully applied to G.

Gilds, see GUILDS.

Gilead ('hard' or 'rugged'), fertile mountainous tract of country traversed by deep ravines, situated in Palestine to the E. of the Jordan. It is bounded on the N. by the R. Yarmak (Hieromax) and on the S. by the Arnon. The tribal land of Gad also seems to have formed part of it. Jephthah and Elijah belonged to this beautiful country. Josephus sometimes mentions it as divided into small provs. called after the caps. estab. by Gk. colonists in the time of the Seleucidae. The chief tns. of G. were Jabesh, Mizpeh, Jazer, Peniel, Succoth, Ramoth-Gilead, Mahanaim, and later Pella and Geresa. See L. Oliphant, *The Land of Gilead*, 1880.

*Giles, St. (Lat. *Aegidius*)*, high born Athenian of holy life, who lived towards the close of the seventh century. His festivl. falls on Sept. 1. In the Middle Ages he was regarded as the special patron of lepers, beggars, and cripples, and his name still survives in the names of some well-known churches. See Rembry, *St. Giles*, 1884.

Giles, or Gilles de Colonne, see COLONNE.

Giles, Ernest (1839-97), Australian explorer, b. at Bristol, and educated at Christ's Hospital, London. He went to Australia at an early age, and in 1872 made an expedition into the interior, which resulted in the discovery of Lake Amadon. He crossed from Adelaidia to Perth about the parallel of 30° S. lat. (1874-76), and recrossed the country between the 21st and 25th parallels, the journey being undertaken on camels. G. proved the interior W. of 132° E. long. to be waste scrub and desert. He pub. *Geographical Facts in Central Australia* (Melbourne) (1874); *The Journal of a Forgotten Expedition* (Adelaide) (1880); and *Australia Twice Traversed* (1889).

Gilgal, name given to sev. places which are mentioned in the O.T. as being in Palestine. One is mentioned in Joshua iv. 19 as being about 3 m. E. of Jericho. Another place of similar name was to be found in Mt. Ephraim, N. of Bethel, and a third S.E. of Cesarea, known as G. of the Goim. In Samaria there was another situated near Shoochem, and a second near Jericho is mentioned as one of the sacred places in the time of Samuel.

Gilgamesh Epic, old Babylonian epic, the fragmentary remains of which were found inscribed on twelve tablets in the library of Assur-bani-pal at Nineveh. It tells of the adventures of G., who was ruler

of Erech and Enkidu. Resembles the story of Nimrod.

Gilgit, or Gilghit, Brit. agency situated in the N.W. of Kashuir. It is the name both of a tn. and dist., and includes Chitral, G., and part of the Indus. It has been the centre of a Brit. agency since 1889. The tn. is situated nearly 5000 ft. above sea level. Area of dist. 30,000 sq. m.

Gill, Arthur Eric Rowton Peter Joseph (1882-1940), Eng. sculptor and typographer, b. at Brighton, son of Rev. A. T. Gill, a minister of the countess of Huntingdon's Connexion, who afterwards joined the Church of England at Chichester. G. was educated at the Preparatory School, Brighton, and, from 1897, at the Chichester Art School. Pupil to Douglas Caroe, the architect, 1889-1903, but preferred letter-carving, which led him on the one hand to sculpture and on the other to the designing of type-faces (notably of the fount known as G. sans-serif). He became an agnostic and later a Socialist. In 1910 he began carving the human figure in stone, and he was encouraged by the approval of Augustus John and by the patronage of Count Kessler. A belief that absolute truth must be ascertainable led him to join the Church of Rome in Feb. 1913, in which year he was commissioned to execute the Stations of the Cross in Westminster Cathedral. After the First World War he carved 'Christ Driving the Moneylenders Out of the Temple' and it was placed as a war memorial at the main entrance to Leeds Univ. Other examples of his work are to be seen at Broadcasting House, at Jesus College, Cambridge, in the Tate Gallery, and in the Victoria and Albert Museum. During the latter part of his life he was a partner in a printing business which specialised in hand-setting. He designed the George VI. series of postage stamps. Though his exquisite carvings are notable for their simplicity of design and boldness of execution, they are often done in that over-conscious defiance of convention which was first made famous by Epstein. G.'s pub. works include *Typography* (1931); *Clothes* (1931); *Work and Leisure* (1931); *Money and Morals* (1934); *Art in a Changing Civilisation* (1934); *Clothing Without Cloth* (1935); *Necessity and Belief* (1937); *Work and Property* (1938); and *Sacred and Secular* (1940). See also ILLUSTRATION.

Gill, Sir David (1843-1914), Brit. astronomer. Accompanied Lord Lindsay's expedition to Indian Ocean. Official astronomer, Cape of Good Hope, 1879-1906; improved observatories and did geodetic work in S. Africa. Made catalogue of stars of S. hemisphere. President Brit. Association, 1907-8.

Gilles de Rais, see HERTZ.

Gillespie, Thomas (1708-74), Scottish divine, b. at Clearburn in Midlothian. He was received into the Presbyterian Church and became minister at Carnock, Fife. He was deposed by the General Assembly in 1752 for what they called contumacy. Attempts were made to get him reinstated, but he refused to re-enter the church

unless they altered their policy. Finally he formed the Relief Church, which was to relieve worshippers from the discipline of the church courts. This body finally amalgamated with the United Presbyterian Church. He pub. *An Essay on the Continuation of Immediate Revelation in the Christian Church* (1771) and *A Treatise on Temptation* (1774).

Gillingham: 1. Municipal bor. of Kent, situated on the Medway, near the tn. of Chatham. The main industries of the tn. are brick and cement manufs., whilst the tn. has also a large torpedo factory. Pop. 62,000. 2. Tn. of Dorsetshire, a few miles N.W. of Shaftesbury. Pop. 3500.

Gillman, Frederick John (1866-1949), Eng. hymn-writer, b. at Devizes, Wiltshire. He was a member of the Adult School movement and the Society of Friends, and was a leading member of the committee which compiled, in association with Sir Walford Davies, the *Fellowship Hymnbook*, pub. in 1909.

Gillray, James (1757-1815), Eng. caricaturist, b. at Chelsea, being the son of a trooper. Successively a letter-engraver and an actor, he became a caricaturist after studying the works of Hogarth. Before 1790 he had estab. himself as one of the most successful of Eng. caricaturists. His caricatures were good-humoured and topical, being aimed principally at Napoleon and the Fr., and also at the leading politicians in England. In a broad way he caricatured the follies and vices of the day. In particular he satirised George III. and his court. See also under CARICATURE. See life by J. Wright, 1851.

Gills, or Branchia, respiratory organs of aquatic animals, consist of delicate expansions of skin through which the oxygen is taken into the blood and carbonic acid emitted. Invertebrates generally respire through the skin, and their G. are merely slight expansions of the body wall; many Echinodermata have their respiratory organs attached to their feet or tentacles, or connected with the thin filaments which float from the head; some of the lower crustaceans, e.g. Phyllopoda and Branchiopoda, also breathe through their feet or through respiratory filaments, as in the case of the lobster. Limulus, the king-crab, is characterised by a series of broad, flat sacs called 'gill books,' which are borne on the abdominal appendages. The lamellibranchiate molluscs usually carry their G. in the form of ciliated plates on each side of the body. In fishes the G. are generally composed of triangular, membranous folds of skin which are supported by the branchial arch, and lie on each side of the gullet. G. are not found in any order higher than the amphibians and in certain cases, e.g. the frog, they are replaced by lungs in later life.

Gilly, industrial tn. in Hainaut, Belgium, just outside the city of Charleroi. There are important coal-mines here. Chief industries are iron and copper founders, glass, chain, bolt, and cable works, boiler construction, brewing, and distilling. Pop. 24,200.

Gillyflower, term applied to sev. very

different plants, but is most often used to indicate *Cheiranthus Cheiri*, the wall-flower. *Dianthus caryophyllus*, the pink, and *Matthiola incana*, the stock, are also called by this name.

Gilman, Daniel Coit (1831-1908), Amer. educationist, b. at Norwich, Connecticut. At the Sheffield Scientific School of Yale Univ. he was prof. of political and physical geography. He had an almost revolutionary influence on Amer. educational methods. In 1872 he became president of the univ. of California, and two years later he became the first president of the Johns Hopkins Univ. He became the president of the Carnegie Institution at Washington in 1901. Amongst his publ. were *University Problems in the U.S.*; *James Monroe*; and *The Launching of a University*. See life by F. Franklin, 1910.

Gilman, Harold (1876-1919), Eng. painter. Early education, Oxford and Slade School. In Spain studied Velasquez, and worked out a technique of delicate colour modulations. Became associated with Sickert and his Saturday afternoon receptions at 19 Fitzroy Street, London, of which Frank Rutter has said: 'Sickert was *chef d'ce*''. Round him gathered gifted equals and juniors - Augustus John, Wyndham Lewis, and Henry Lamb were frequenters. Spencer Gore was his chief of staff, with Harold Gilman as an exceedingly able but sometimes difficult-to-manage aide-de-camp.' Uncompromisingly faithful to impressionist technique, G. became first president of the London group, and later a chief spirit in the Camden Town group (1911). Lived two years in Letchworth, where his style underwent a change, and he left his subdued painting behind. A fellow worker of the Camden Town group, W. Ratcliffe, tells that it was due to the influence of Spencer Gore, who used no medium whatever for his paint, that G. abandoned his thin pigments. A realist absolutely, G. liked painting domestic things, things that went on in the house. Like Gauguin and all the Impressionists, if he saw green in a face, he would put it in strongly green, letting the crude colours balance one another. He did many portraits of his mother, an example being among the purchases of the Chantrey bequest. Other outstanding works are a beautiful snow piece done at Letchworth, 'Children,' the luminous 'Washing Day,' the rich 'Yellow Hat,' landscapes, and 'Hampstead Road' (1914). His last and perhaps greatest picture, 'Hullfay Harbour, Canada' (6 ft. by 4 ft.), was finished Oct. 1918, and is at Ottawa. As stated in *The Times* when G.'s work was exhibited at the Lefèvre Gallery in 1918, he 'was endowed with real originality of vision, as well as an obvious and professional mastery of his medium.' G. lived his art. See F. Rutter, *Art in My Time, 1933*, and C. Ginner, 'The Camden Town Group' in *The Studio*, Nov. 1945.

Gilpin, Bernard (1517-83), Eng. clergyman, known usually as the 'Apostle of the North,' b. at Kentmere Hall, Westmorland. He was educated at Queen's Col-

lege, Oxford. After accepting a vicarage for a short time, he travelled in France, and studied at Louvain and Paris. On his return he was made archdeacon of Durham. His fearlessness and outspokenness gained for him many enemies, but he was ultimately appointed rector of the par. of Houghton-le-Spring. He was offered the bishopric of Carlisle, but preferred to remain in his own par. Here his influence for good was enormous. He did much for education, and built and endowed a grammar school. Spent much of his time in the wilds of Cumberland and Northumberland, on what were called missionary journeys.

Gilyaks, Gee-laks, or Ghilliaks, aboriginal race in Siberia. Their country extended from Tambovt or Girin, some 350 m. S. of Nikolaevsk, to the coast near the mouth of the Amur, as well as over the N. half of the Is. of Sakhalin. Réclus, who called them 'Giliaks' or 'Kilé,' holds the view that they were 'related to those mysterious Atkins who are the object of so much discussion among ethnologists.' Be that as it may, much light was thrown on their curious superstitions and primitive habits by Henry Lansdell, the famous missionary, who journeyed through Siberia in 1878. Lansdell regarded the race as the most thoroughly heathen in Siberia and he indicated in his *Through Siberia* that though there was trade between Europeans and the G., very little was known of them. As a matter of fact they were a fast disappearing race even when Lansdell visited them. Women occupied a low position among the G., who, like the neighbouring Goldi, were polygamists, and, according to Jap. records as quoted by Ravenstein, polyandry also prevailed. In stature these aborigines were diminutive, usually below rather than above 5 ft. Their skin was tawny, like the Chinese; hair black and not thick. They subsisted entirely on fish. Extremely superstitious, the G. believed in wooden idols and charms as antidotes to disease. Their idols were in the form of the tiger, bear, etc., which animals were closely connected with their superstition, if not their religion. The 'shamans' or priests, who might be male or female, were regarded as powerful mediators between the people and the evil spirits. Consult also P. M. Collins, *Siberia to Japan, 1866*, and the same author's *A Voyage down the Amoor, 1860*.

Gin, or Geneva, spirit distilled from malt, or from unmalted barley or other grain, and afterwards rectified and flavoured very slightly with oil of turpentine or juniper. It contains from 40 to 50 per cent of alcohol. Sweetened G. or Old Tom is made by adding the right proportion of sugar to the ordinary spirit. Hollands (i.e. Schiedam, or schnapps), is a variety made at and around Schiedam in Holland, from rye meal and malt, and is flavoured with juniper berries. The word G. is a shortened form of Geneva, so called by confusion with the Swiss tu., but is really a corruption of the O.F. *genivre*, meaning 'juniper,' from the Lat. *juniperus*. G. is often adulterated with potato spirit, nutmeg, caraway, capsicums, etc.

Ginatilan, tn. on the S.W. coast of Cebu, Philippine Is., 65 m. S.W. of Cebu. Cotton, tobacco, sugar-cane, rice, etc., are grown. Pop. 12,000.

Ginchy, Fr. vil. 7 m. E. of Albert, which was the scene of many engagements in the battles of the Somme in 1916. In 1928 a Brit. war memorial to the Guards was erected there.

Gindely, Anton (1829-92), Austrian historian, b. in Prague, where he received his education. In 1862 he was appointed prof. of hist. at the univ. there, and not long afterwards archivist to the kingdom of Bohemia. His works include *Geschichte des dreissigjährigen Krieges* (1869-80); *Rudolf II und seine Zeit* (1862-65); and *Geschichte der Gegenreformation in Böhmen* (1894).

Ginger (*Zingiber*), E. Indian plant belonging to the genus of Zingiberaceae, which has been cultivated from the earliest times in the E. Indies. It grows in damp, moist places in various parts of tropical Africa, and is cultivated particularly in Jamaica, where many varieties are dealt in commerce. The cultivation is quite simple. When the rootstock is taken up, on the withering of the stems, it is prepared for the market by scalding, or by scraping and washing, the first method yielding black G., the second white G. G. is put to many uses; medicinally as a stimulant and carminative, as a condiment or preserve, and sometimes, when green and mixed with other herbs, as a salad.

Gingko, Jap. name for a genus of deciduous coniferous plants consisting of a single species, *G. biloba*, the maidenhair tree, which bears large, yellow, edible fruit and delicate foliage. The Jap. hold the tree as sacred and plant it round their temples.

Ginguene, Pierre Louis (1741-1816), Fr. man of letters, b. at Rennes in Brittany and educated at a Jesuit college there. In 1777 he composed a comic opera entitled *Pomponius*. In 1791 he pub. *Lettres sur les confessions de J. J. Rousseau*, in which he defended the life and principles of that author. He spread the principles of justice and liberty at the beginning of the Fr. Revolution in his paper, *La Jeune Régulière*, and this led to his imprisonment during the Terror, only escaping with his life on the downfall of Robespierre. G.'s ablest work is his *Histoire littéraire de l'Italie* (1811-30).

Ginkel, Godart, see ATHLONE, EARL OF.

Ginosa, in Italy, a com. of Naples, situated in the prov. of Otranto. Pop. 10,000.

Ginsburg, Christian David (1831-1914), Heb. scholar, n. at Warsaw, Poland. He was educated at the Italianic College in his native city, and afterwards pursued the study of the Heb. scriptures, with special regard to the Megilloth, in England. His first trans. was that of the *Song of Songs*, and this he followed up with a trans. of *Ecclesiastes*. In 1870 he was appointed a member of the committee for the revision of the Eng. version of the O.T. His *magnum opus* was the *Masorah*, pub. in three vols. Later publs. were *The Text of the Hebrew Bible in Abbreviations*

(1903) and *Facsimiles of Manuscripts of the Hebrew Bible* (1905). He also contributed many articles to the *Encyc. Brit.*

Ginseng, or *Aralia quinquefolia*, species of Araliaceae, well known on account of its doubtful medicinal properties. The root is used by the Chinese as a tonic and stimulant.

Gioberti, Vincenzo (1801-52), It. philosopher, publicist, and statesman, b. in Turin. He was educated for the priesthood and ordained in 1825, and was subsequently appointed prof. of theology in the univ. of his native city. In 1833, the period of rising political agitation, G., who was chaplain to the king, Charles Albert, was dismissed from court and imprisoned on an accusation of promoting the Liberal movement. He then went to Paris and Brussels at the latter city spending eleven years as tutor in an academy. During this time he wrote many works of philosophical importance, formulating his theory of platonian idealism tinged with pantheism. His political ideal was a confederated Italy, with the pope at the head and the king of Sardinia as military guardian. His chief works are *Il Gesuita modenese*, an exposure of the Jesuits which precipitated the transfer of rule from clerical to civil hands; *Il primo morale civile*, identifying religion with civilization and reaching the conclusion that the church is the axis on which the well-being of human life turns; *Prologia*, on the same theme but less emphatic; *La Provoca del sovrannaturale*, on the reality of revelation and a future life; and *Introduzione allo studio della filosofia*, on method and terminology in philosophy; and *Aurora prospetto delle scienze economiche*. See Massati, *Vita di V. Gioberti*, who has ed. his entire writings. See also G. Gentile, *Prophets of the Italian Rising* (in It.), Florence, 1923.

Giocondo, La (Fr. *La Joconde*), famous portrait of Mona (Madonna) Lisa, 'with the ineffable smile,' wife of Francesco del G. (1468-1528), painted in Florence by his friend Leonardo da Vinci (c. 1502). It is said that he worked on it for four years, and even then considered it unfinished, surrounding her with all kinds of amusements to keep the divine smile upon her lips. The beautiful canvas was acquired by Francis I. for the Louvre. It was stolen from there in 1912 but subsequently recovered. There has naturally been many copies, and it was even claimed, but on insufficient evidence, that the Louvre treasure was not the original. Vasari, Michelet, Théophile Gautier, Gustavo Planche, and George Sand wrote enthusiastically about the picture.

Giocondo, Fra Giovanni (1450-1515), It. architect, engineer, and antiquary, b. at Verona. He became Franciscan friar and went to Rome to study archaeology, where he made a wonderful collection of over 2000 ancient inscriptions. He was the architect of King Ferdinand of Naples, and later of Charles VIII. of France. He is said to be the designer of the Hôtel Dieu, Pont Notre Dame, and Chambre des Comptes. G. was also learned in philosophy and classical literature, and

wrote notes on Caesar's *Commentaries*. See studies by F. Fiocco, 1916, and G. Badego, 1917.

Gioja, Melchiorre (1767-1829), It. writer on philosophy and political economy, b. at Piacenza. At Milan he was appointed by the Fr. Gov. director of the statistical bureau. G. was one of the first investigators to apply statistics to questions of public morality and political economy. *Filosofia della statistica*, G.'s latest work, contains briefly his ideas on human life, and affords the best insight into his aims and methods. He also wrote *Del merito e delle recompense* (1818), a large treatise giving a systematic description of social ethics from the utilitarian standpoint, and *Nuovo Prospetto delle scienze economiche* (1815-17), containing much valuable information. This last may be considered the best and most original treatment of the day, of labour since Adam Smith's *Wealth of Nations*.

Giolitti, Giovanni (1812-1928), It. statesman, b. at Mondovì in the prov. of Cuneo. He received his education at Turin, and after a rapid career in the financial administration, b. was appointed councillor of state and elected to Parliament in 1882. He became minister of the treasury in 1889 and minister of finance in 1900, but he was soon compelled to resign this position on account of his policy of extreme economy. Two years later he became president of the ministry, and during his tenure of office succeeded in introducing many needed reforms in favour of the lower classes. In 1901 he was minister of the interior and in 1906 Premier. Was pro-tirer in the First World War and a pacifist. Italy having decided to join the Entente nations, G. was replaced in power by Baron Sonnino, and thereafter formulated a new programme of Socialism. In his paper, the *Stampa*, he laid down a vast plan of social, economic, and political reforms, including the abolition of secret diplomacy. He, however, never returned to office. In the plenitude of his power he had been virtually dictator of Italy and was a statesman of undoubted abilities. His autobiography *Memorie della mia vita* was pub. in 1922. See B. Croce, *History of Contemporary Italy*, 1871-1915, and Count Sforza, *Makers of Modern Europe*, 1930.

Gioma, see DAGO.

Giordani, Pietro (1774-1818), It. author, b. at Piacenza. His writings are numerous, the most valuable being the collection of letters *Epistolario*, pub. with the *Opoere*. He also wrote various critical essays, political pamphlets, eulogies, and memorial addresses. In his youth G. joined the Benedictine Order, but in 1808 he left it to become secretary of the Academy of Bologna. This office, however, he was obliged to give up in 1813 on account of his Liberal political views, and from that date till his death he continued to fight for the cause of liberty, being remembered as a great patriot as well as a noted writer. G. is considered as one of the greatest classical scholars of his day. See G. Romani, *Della vita e delle opere di Pietro Giordani*.

Giordani, 1868; also lives by C. Viani, 1920, and G. Leopardi, 1937.

Giordano, Luca (1632-1705), It. painter, b. in Naples. The first rudiments of drawing he acquired from his father, Antonio G., who was, however, an indifferent painter. He painted with great facility at a very early age, and at the age of thirteen he was placed under the instruction of Jordaens. His father later took him to Rome, where he studied under Pietro da Cortona and copied many of the great master's pictures. He also visited Venice and studied the works of Paul Veronese and Titian. G. painted a great number of pictures, which may be seen in the chief galleries of Europe. One of the most famous is 'Christ expelling the Traders from the Temple' in the church of the Pedri Girolamini in Naples. Others of note are 'The Judgment of Paris,' in Berlin, and 'Christ with the Doctors in the Temple,' in Rome. See W. Roß, *Geschichte der Malerei Neapels*, 1910, and studies by E. Petraccone, 1919, and A. de Rinaldis, 1922.

Giordano, Umberto (1867-1949), It. operatic composer, b. at Foggia, son of an artisan and educated at the Conservatoire, Naples. His first opera, *Marina*, was written while he was still a student, and his next, *Maliblù*, was written in 1892. He was a popular composer in the tradition of romantic realism that was the vogue at the end of the last century and most of his themes were melodramatic. His best known opera is *Andrea Chénier* (1896), which, however, suffered by comparison with the work of his contemporaries, Mascagni, whom he somewhat resembles, and Puccini. It was last performed at Covent Garden in 1930. His *Fedora* (1898), composed to Sardou's text of the same name written for Sarah Bernhardt, enjoyed some success. He was still writing operas as late as 1928 when *Il Re*, founded on a fabl, was produced to celebrate the reopening of La Scala, D. at Milan.

Giorgio, Francesco (1439-1502), It. architect, sculptor, engineer, painter, and bronze-caster, b. at Siena. He is prominent among the artists of the Renaissance on account of his great versatility; but he principally devoted himself to engineering and military architecture, his services being constantly in demand by the Sienese Republic. His prin. authentic picture is that of the Madonna and Child enthroned in the church of Siena, though there are many others in the different galleries of Europe attributed to him.

Giorgione da Castelfranco (1477-1511), one of the chief Venetian painters of the High Renaissance, whose real name was Giorgio Barbarelli, Giorgione (Big George) being applied to him on account of his ability. He was b. at Castelfranco, but we have very me. re information as to the facts of his life. He appears to have been of humble origin, and was brought up at Venice, where he seems to have served his apprenticeship under Giovanni Bellini, and it was at Venice that he became famous. In 1500, at the early age of twenty-three, he was chosen to

paint portraits of the Doge Agostino Barberigo and the condottiere Consalvo Ferrante. He decorated the façades of about half a dozen palaces in Venice, which have long since been defaced, the most important being that of the Fondaco dei Tedeschi (1508). All accounts of his life represent G. as being a person of great social charm, a musician, and a romantic and ardent lover; he is said indeed to have d. in consequence of a love affair. It has been said that G.'s position in Venetian arts was similar to that of Leonardo in Florentine art. Quite 150 paintings are attributed to him in the



W. J. Mansell
GIORGIONE
Self-portrait.

European galleries, but only a few are of undoubted authenticity, notably 'Madonna enthroned between Saint's Liberale and Francis,' in the cathedral of Castelfranco; 'La Famiglia di Giorgione,' in Venice; 'Three Eastern Sages,' in Vienna; 'The Three Ages of Man,' in Florence; and 'The Sleeping Venus,' in Dresden. G. d. at Venice at the zenith of his popularity. See studies by L. Justi, 1926, and Sir M. Conway, 1929.

Giottino (Tomasso di Stefano) (1321-57), It. painter of the school of Giotto, sur-named G. because he imitated the manner of Giotto, his great predecessor. He decorated the Vatican Palace at Rome, and he painted numerous frescoes and oil pictures, many of which are extant. The following are attributed to him: 'Deposition' in the Uffizi; 'Crucifixion' and 'Adoration' in the Strozzi Chapel at Santa Maria Novello; and the 'Legend of Constantine and Pope Sylvester' at Santa

Croce in Florence. See G. Vasari, *Lives of the Painters*, etc.

Giotto (Ambrogio di Bondone), It. painter, architect, and sculptor, b. in Florence, probably in 1266 or 1267. There are but few known facts about his life, but he was the son of a peasant landowner, it is generally agreed, who, though of no large possessions, was of reputable descent. From G.'s works it is evident that he was a pupil of the Rom. school, developing its early Christian and classic side. His earliest works are to be found in the church of St. Francis at Assisi. Here is his series of the 'Life of Christ' and the 'Allegories of St. Francis.' In 1298 G. painted the altar-piece of St. Peter's at Rome and designed the 'Navicella' in mosaic—Christ saving St. Peter from the waves. This is still to be seen in the vestibule of St. Peter's. The series of frescoes with which G. decorated the walls of the chapel built in Padua in honour of the Virgin brings us to the greatest of his undestroyed enterprises. These frescoes were painted in 1303, and illustrate the life of Christ and the life of the Virgin in thirty-eight scenes. In these G. reaches the height of his genius. G. next returned to Florence and Assisi, where he painted the four famous allegorical frescoes in the vault of the church: 'The Marriage of St. Francis with Poverty,' 'The Triumph of Charity,' 'The Triumph of Obedience,' and 'The Glorification of St. Francis.' Though perhaps hardly of the first rank, G. was an architect and his masterpiece of design, the Campanile, known as G.'s Tower was begun in 1334, when he was made chief architect of the Florentine cathedral. Though unfinished at his death, the Campanile was carried out according to G.'s plan in every detail. Its reliefs and statues are among the finest works of It. Gothic sculpture. The art of painting, as re-created by G., was carried on by his pupils and successors throughout Italy, with but little change or development, for nearly a hundred years. G. d. in 1336. See biographical studies by L. B. Supino, 1920; C. Garra, 1925; E. Cecchini, 1937; and T. Hefter, 1911.

Giovanni de' Medici, see LIO (popes), Leo X.

Giovanni di Fiesole, see ANGELICO, FRA.
Giovanni Maria del Monte, see JULIUS (popes), Julius III.

Gipping, see ORWELL.

Gippsland, in Australia, the S.E. dist. of Victoria, named after Sir George Gipps, governor of New S. Wales from 1838 to 1846. It has an area of nearly 14,000 sq. m., and though mountainous in the N.E. is of a more agric. nature in the S.W., where farming and cattle-grazing are carried on. Its chief mineral wealth consists of gold, silver, copper, lead, coal, etc.

Gipsey, see GYPSIES.

Giraffe, also known as Camelopard, tallest of all mammals. *Giraffa*, the Sp. name, is derived from the Arabic *zaraf*, whilst the classic term *camelopard* probably came into use when these animals were introduced into the Rom. amphitheatre from N. Africa. This name has

now more or less fallen into disuse. The G. constitutes a distinct family of ruminants, containing one species only. It is a native of Africa, and is found S. of the Sahara, generally in herds of from five to forty. The chief characteristic of the animal is the enormous length of the neck and limbs, and the long, tufted tail. Its tongue is also remarkable for its great length, combined with elasticity and power. The head is furnished with two protuberances between the ears, commonly described as horns. The G. is an inoffensive animal and usually seeks safety by flight, not being easily overtaken even by a fleet horse. When fighting it kicks



GIRAFFE

swiftly with its hind legs and can make a stout resistance, being capable of even keeping off a lion. Persecution has of late years much reduced the number of G.s., and led to their extermination from many dists. G.s. were first brought to the Zoological gardens in London in the year 1836, and since then many specimens have been acquired which have bred in the Gardens. The G., however, is rather a delicate animal, and needs care in captivity. These animals are essentially inhab. of open country. G.s. are able to browse on tall trees with the greatest of ease by reason of their long necks and flexible tongues, and they are capable of going for a long time without water and seldom feed on grass. In their native state in Africa, when standing among the mimo-a-trees, they can often hardly be detected, as they harmonise so completely with their surroundings. See also under CAMELO-PARDALIS.

Giraldi, Giglio Gregorio, or Lilius Gregorius (1470-1552), It. poet and archæologist, b. at Ferrara. In 1507-8 he was at

Milan, studying Gk. Thence he went to Modena, and became tutor to a son of Count Nicole Rangone—Ercole, afterwards cardinal. He went with his pupil to Rome, and became protonotary apostolic. His library was destroyed in the sack of Rome, 1527. He was an elegant Lat. poet, and systematised classical mythology.

Giraldi, Giovanni Battista (1504-73), It. author, b. at Ferrara, son of Christophero G. Became prof. of medicine and philosophy at the univ. of Ferrara, 1525. Obtained chair of belles-lettres in succession to Celio Calcagnini, 1537. About 1542 became secretary of state under Ercole d'Este II.; was continued in that employ under Alfonso II. As a member of the Accademia delle Affidati he took the surname of Cinzio, and is commonly known by this assumed name, which, anglicised, is Cinthio. Wrote nine tragedies, the best known of which is *Il Orberche* (1541). *Gli Hecatommithi* (or 'A Hundred Novels') (1565) is a famous vol. of tales. Shakespeare borrowed from this source his plots in *Measure for Measure* and *Othello*, though in the latter play he profoundly modified the relations of Othello and Iago and introduced two new characters in Roderigo and Emilia.

Giraldus Cambrensis (c. 1116-c. 1220), medieval historian and ecclesiastic, also called Gerald de Barri, of Eng. descent. Under the influence of his uncle, bishop of St. David's, he took holy orders about 1172, and soon afterwards became archdeacon of Brecknock. This position he filled for four years, and then retired to the univ. of Paris, where he resumed the study of law and theology. In 1184 he returned to England, was made one of the king's chaplains, and accompanied Prince John on his voyage to Ireland. See *Itinerary* (Everyman's Library), 1908.

Girardin, Emile de (1800-81), Fr. politician, journalist, and legislator, the illegitimate son of Alexandre, comte de G. (d. 1855). His idea of a halfpenny newspaper was carried out in 1836, when he founded the *Presse*, a jour. of Conservative and Royalist tendencies. Attacks on this led to the quarrel and duel in which G. killed Armand Carrel, editor of the *National*. Till the revolution of 1848 G. was occupied with politics, gradually becoming a decided Republican. In 1866 he left the *Presse* to direct the *Liberté*, in which he wrote vehemently against Prussia and voted for war (1870). His works (apart from journalism) include *La Fille du millionnaire* (comedy, 1858); *Le Supplice d'une femme* (with Dunas fils, 1865); *De la presse périodique au XIX^e siècle* (1837); *De la liberté de la presse et du journalisme* (1842). His first wife was Delphine Gay (1804-55), who wrote 'Lettres parisiennes,' under the pseudonym 'Vicomte de Launay,' in the *Presse* (1836-47). See his *Collected Works*, 1860-61; G. d'Helly, *Mme de Girardin*, 1868; Saint-Amand, *Mme de Girardin*, 1874; and lives by M. Reclus, 1934, and P. Simnare, 1934; also J. Morieuval, *Les Créateurs de la grande presse en France*, 1934, and G. Weill, *Le Journal*, 1934.

Girardon, François (1628–1715). Fr. sculptor, sent by Séguier first to Auger's studio, and then to Rome. On his return he obtained a position at court, decorating the palaces at Versailles and Trianon under Lebrun's direction. Admitted to the Academy of Painting and Sculpture in 1657 he became prof. in 1659. Chief among his works is 'Tombeau de Richelieu' at the Sorbonne. Others are the white marble medallion of Louis XIV., presented to his native Troyes (1690); equestrian statue of Louis XIV. in Place Vendôme (1699); 'L'âliver' and 'L'Enlevement de Proserpine' at Versailles. G. was a friend of Condé, Boileau, Racine, and La Fontaine. He married Catherine Duchemin (d. 1698). See life by P. Francartel, 1929.

Giraud, Count Giovanni (1776–1834). It. comic writer of Fr. descent. His first work, *L'Onesta non si rince*, appeared in 1799. He wrote also comedies (4 vols., 1808), somewhat resembling Goldoni's, the most popular being *L'ijo n'l'Imbarazzo* (*Le Préteur dans l'embarras*, 1807). His *Teatro domestico*, 1816–25, was a collection of plays for children, partly in imitation of Berguin's works (1719–91). He raised a squadron of cavalry (c. 1798) to defend Pope Pius VI. against the Fr. (i. became director of all the theatres in Italy (1813–31), but ruined himself by speculation.

Giraud, Henri (1879–1949). Fr. soldier, b. in Paris, of Alsatian descent, and educated at St. Cyr. A captain of the Zouaves in the First World War, he was wounded at the battle of Guise and, left on the field for dead, was taken prisoner by the Germans. A few weeks later he escaped from a hospital in Germany and, through his skill with horses, successfully posed as a bus conductor and circus hand, and so made his way into Holland. At the armistice he was a major with four bars to his Croix de Guerre, and chief of staff of the Moroccan Div. Between the two world wars he saw service in the Ruff campaign and, in 1939, was military governor of Metz. On the outbreak of war he was given command of an army in Holland, but was again captured by the Germans, who, mindful of previous experience, kept him under vigilant surveillance at Königstein. But again, after careful devising, G. escaped and, despite the offer of a large reward for his recapture, reached unoccupied France (April 1942). To Pétain he pledged himself not to join de Gaulle, but he refused to give any promise not to take up arms against the Germans. Having, however, decided to serve with the armies of Gen. Eisenhower, he escaped from France by boarding a Brit. submarine at the narrow risk of being drowned and, on the day of the allied landing in N. Africa, broadcast an announcement that he had assumed the command of the Fr. forces there, thus associating himself with Adm. Darlan (q.v.). After the murder of Darlan he was unanimously chosen by the Fr. Council to be high commissioner in Fr. N. Africa, as well as commander-in-chief. At meetings with de Gaulle it was agreed to set up a

committee for National Liberation under the joint chairmanship of both generals, but this arrangement was abandoned after the creation of the provisional Consultative Assembly had brought about considerable changes in the membership of the committee. In the spring of 1944, however, his post of commander-in-chief was abolished—nominally because the Fr. forces were assigned to various allied commands, but actually because the men of the *maquis* or resistance movement distrusted him as a representative of the *ancien régime*. He rejected the offer of the post of inspector-general of the Fr. Armies. His last order of the day as commander ended with what, in the circumstances, were peculiarly poignant words: 'There is only one voice, that of France. Men may go, France remains.' G. was one of the most distinguished Fr. soldiers of his day, and regarded as a leading strategist. He was awarded the Médaille Militaire in 1919, shortly before his death.

Girba, see JERBA.

Girder, beam of metal or wood intended to be supported at either end, and to carry a vertical load between the ends. A G. spans the distance from wall to wall and supports a superstructure, such as the pathway of a bridge, a floor, etc. G.s. either extend over one or more intermediate supports, or are supported only at the two ends. In the latter case they are called simple G.s.; in the former, continuous. The upper and lower flanges of a G. are connected by a solid web, or by an open framework of diagonal and vertical members. G.s. naturally differ according to the purpose for which they are required. A sandwich G. is one which is composed of two wooden beams, with an iron flitch plate between, all bolted together. Again, a box G. is one in which the flanges are connected by two web plates, so that a cross-section of the G. is box-like in form. G.s. are mainly used in connection with bridges (commonly being of steel, which has almost entirely replaced cast iron and wrought iron), of which they form the principal component parts, and they are employed generally to form the horizontal weight-bearing members in steel and iron structures of every kind. G. bridges are generally used for short spans, seldom exceeding 100 ft. In plate-G. bridges the G.s. have solid webs composed of steel plates, and of recent years longer G.s. have come to be constructed. The longest ones are those of the viaduct on the Riverside Drive in New York, erected in 1900, the span being 126 ft. A more extensive adoption of plate-G.s., together with new designs and details, has arisen in consequence of the large amount of new construction and corresponding increase in the weight of rolling-stock in recent years.

Girgeh, Gurga, or Jirgeh, prov. and tn. of Upper Egypt. Area about 675 sq. m. Cap. of prov., Suhag. Pop. 1,288,400. The tn. is on the Nile's l. b., and on the railway from Cairo to Assuan, 80 m. from the ruins of Thebes. It is the seat of a Coptic bishop, has a Lat. monastery, and

a gov. cotton factory. Most of the inhab. are Christians. Pop. 31,900.

Girgenti: 1. Prov. of Sicily, on S.W. coast. It is hilly, but produces cereals, fruits, olive-oil, sulphur, salt, and fish. Area 1172 sq. m. Pop. 435,000. 2. Cap. of above and episcopal see, on an eminence overlooking the sea near the site of anct. Agrigentum, on S. coast, about 60 m. from Palermo. Porto Empedocle, its port, is protected by a mole built on the ruins of an anct. temple. Officially the port includes Licata and Siculiana, and these are the chief tns. in Italy for exporting sulphur. Remains of Agrigentum (fl. 560-406 B.C.) are to the E. of the modern tn. There are interesting medieval buildings, gates, and churches, notably the cathedral (fourteenth century). The library was founded by Bishop Lucchesi, 1705. The Saracens took it, from the Gks., 828, and in 1086 Roger I. took it from them and founded a bishopric. In the fighting of 1913 the frescoes of S. Gerlando Cathedral, the convent of the Santo Spirito, and the museum all suffered damage from bombardment, but the Gk. and Rom. ruins of the great temples were unscathed. Pop. 31,000.

Grig, son of Bimhal, associated with Eochaid in the government of the Pictish kingdom, A.D. 878-90. Hero of numerous stories of more or less apocryphal character. Said to have liberated his country from the Dan. invaders, to have overrun Lothian, and to have subjugated Ireland. In consideration of the privileges he conferred on the monks of St. Andrews, he has been styled the liberator of the Scottish Church.

Girl Guides. This movement was founded in 1910 by Lord Baden-Powell as a parallel organisation to the Boy Scouts. The Brit. headquarters are at 17-19 Buckingham Palace Road, London, S.W.1, and there are training centres for guiders in various parts of the country.

In 1948 the total membership in Great Britain and Ulster was 145,000, and the world membership in thirty-one countries throughout the world was 2,500,000. The president of the Brit. Girl Guides Association is the Princess Royal, and Princess Elizabeth is chief ranger of the Brit. Empire. Lady Baden-Powell is the world

chief guide. Guiding provides a progressive training for girls between the ages of 7½ and 21, as Brownies (7½-11), Guides (11-16), and Rangers (16-21). The adult leaders are known as guiders and commissioners, and the cadet section is responsible for training girls between the ages of 16 and 21 as potential guiders. The extension section provides Ranger and Guide companies and Brownie packs for physically and mentally handicapped children, and the auxiliary section caters for those in homes and schools for girls taken from undesirable surroundings.

Lone companies are formed for girls who are unable to join ordinary companies owing to their work or where they live. The aim of the Guide movement is to give individual character training through healthy, happy, and adventurous activities; training them in habits of observation, self-reliance, and thoughtfulness for others, teaching them services of value to the public, handicrafts useful to themselves, and promoting their physical, mental, and spiritual development. Special emphasis is laid on camping and other outdoor activities. Membership is open to every girl, irrespective of colour, class, or creed, who is willing to subscribe to the basic principles of the movement, and to keep the promises made at her enrolment. See Sir R. Baden Powell, *Girl Guiding*, 1921; Ann Kindersley (editor) *The Guiding Book*, 1922; and J. Potts, *Girl Guide Badges*, 1924.

Girnar, sacred mt. in the fudatory state of Junagadh, India, S.W. of the peninsula of Kathiawar, 230 m. from Bombay. There are sov. Jain temples, and at the base valleys, gorges, and slopes covered with jungle. Altitude 3500 ft.

Girodet-Trioson, Anne Louis Girodet de Roussi (c. 1767-1821), Fr. painter, pupil of Luquin and David. He won the Grand Prix de Rome with 'Joseph vendu par ses frères' (1793). He travelled in Italy and France, and was awarded the Légion d'Honneur, 1816. His works include 'Danae' (1798); 'The Seasons' (1799); 'Osuan and his Warriors'; 'Scène du Deluge' (1806); 'Sommeil d'Endymion' (1792); 'L'Inhumation d'Atala' (1808) (the last two both in Louvre); 'Portrait of Napoleon I.'; and 'Aurora' (1806, Leipzig Museum). See M. Coupin (editor), *Euryes posthumus*, 1829, and life by P. A. Leroy, 1892.

Gironde, maritime dept. of S.W. France, near the G. estuary, formed by the confluence of the Garonne and Dordogne, bordering the bay of Biscay. It comprises part of anct. Guienne, is fertile in the E., but belongs to the region of the Landes on W. coast, being separated from the sea by sand-dunes, 35 to 300 ft. high, extending for 75 m. The dist. is particularly famous for wine (especially claret). The two chief dists. are 'region grondine,' above Bordeaux, and Médoc below Bordeaux. The three great vineyards are Château-Margaux, Château-Lafite, and Château-Latour. Turpentine, pitch, and charcoal are obtained from the pine plantations on the coast (landaise). Grain, vegetables, fruit, salt, sugar, tobacco, candles, etc., are produced. There are five arrs.: Bordeaux (cap.), Blaye, Lesparre, Libourne, and Langon. In the Second World War operations were carried out in the spring of 1945 by Fr. forces against the Ger. pocket which had continued to hold out at the mouth of the G. Extensive air operations supported the offensive. These operations against the G. enclave—for the rest of France had long been liberated—were launched on April 14. Long isolated and now demoralised by the allied successes on the main fronts, the Ger. defenders were incapable of any extended resistance, and



THE GIRL GUIDE BADGE

the final elimination of the enemy in the area was achieved with the reduction of the is. of Oléron on May 1. Area about 4140 sq. m. Pop. 858,000.

Girondists (Fr. *Girondins*), moderate Republican party amongst the great political parties of the Fr. Revolution, which played a distinguished part in the Legislative Assembly (1791-92) and the Convention. The dept. of Girondins sent up as its representatives the earliest leaders of this party, hence the name. In the legislative assembly the G. held the most commanding position, being the leaders of the progressive or revolutionary party, and they were distinguished by such men as Vergniaud, Gaudet, Isnard, and Brissot, the last named, though perhaps not so distinguished an orator as his co-workers, being a noted statesman. Early in 1792 Louis XVI. was obliged to form a Girondist ministry with Roland and Dumouriez as its chiefs. It was, however, short-lived, and on its close dissensions broke out between the G. and the more extreme members of the assembly. After the National Convention the G. tried to save the king's life but were unsuccessful, and the last effort of the party was an ineffectual attempt to impeach Murat, who, however, overthrew and arrested many of their number. From 1793 may be dated the fall of the G. See A. de Lamartine, *Histoire des Girondins*, 1847; J. Jaurès, *Histoire socialiste de la Révolution française*, 1923; and A. Mathiez, *Girondistes et Montagnards*, 1930.

Girouard, Désiré (1836-1911), Canadian judge and legal writer; b. July 7 at St. Timothée, Quebec Prov.; graduated from McGill Univ.; practised at the Montreal Bar, 1860-95. He was member of the dominion Parliament for J. Cartier, 1875-1895, carrying the Deceased Wife's Sister Bill, 1882. Judge of the Supreme Court of Canada from 1895. He became deputy governor-general of Canada, 1910. One of the founders of the *Revue critique*. His publs. include *Lake St. Louis: Old and New* (1893; supplement, 1903) and *La Salle* (1893), as well as a number of legal treatises and sev. works on the hist. of the G. family.

Girtin, Thomas (1775-1802), Eng. painter and etcher. He was apprenticed to a mezzotint engraver and soon estab. a reputation by his engravings. He practically estab., however, the modern school of water-colour painters. From 1794 to hi. death he exhibited at the Academy. See L. Binyon, *Thomas Girtin*, 1900.

Girton College, college of Cambridge Univ., for women. The original college was opened at Benslow House, Hitchin, on Oct. 16, 1869, under the name of the College for Women. The present site in the par. of Girton, 2 m. W. of Cambridge, was purchased in 1872 and the college was then renamed G. C. the removal to the new building taking place in Oct. 1873. Ordinances of 1923 admitted members of the college to univ. lectures and laboratories and to the univ. library; and under the univ. statutes of 1926 members of the college became eligible for all univ.

teaching offices, and for membership of faculties and boards of faculties. Its royal charter was granted in 1924. Entrance scholarships and exhibitions are awarded on the results of a school examination held jointly with Newnham College. Scholarships are of a minimum value of £30, with a possible increase up to £100 for a major, or £50 for a minor, scholarship. Exhibitions are of a minimum value of £15, with a possible increase up to £30. There are also a number of foundation scholarships founded between 1876 and 1943, besides two musical scholarships, and ten studentships and graduate scholarships.

Girvan, tn. and par. of Ayrshire, Scotland, about 20 m. from the co. tn. of Ayr. It is a well-known health resort, and is noted also for its herring fisheries. Pop. 6700.

Gisborne, tn. in the N. Is. of New Zealand. It is the trade centre and port of the rich agric. and pastoral dist. of Poverty Bay. A sunny climate and up-to-date recreational facilities make G. one of the most attractive holiday resorts. It has daily communication with other parts of New Zealand by rail, road, and air. G. is renowned as the first landing place in New Zealand of Capt. Cook (Oct. 1769). Pop. 16,200.

Gisors, Fr. tn., dept. Eure, situated some 30 m. E.S.E. of Rouen; it was originally a Norman tn. of some importance. The castle was partly built by Henry II. of England and the tn. still retains many fine old buildings. It suffered some damage in the Second World War. It manufs. nowadays lace, linen, and leather. Pop. 5800.

Gissing, George Robert (1857-1903), Eng. novelist and miscellaneous writer, b. at Wakefield, Yorkshire; studied at Owens College, Manchester. Of a curiously 'unpractical' temperament, he led a chequered and usually unhappy career. Beginning as a clerk in Liverpool, he next went to America, returning to Europe in 1877 to study at Jena. He returned to England in 1878 and eked out the livelihood gained from his novels by taking pupils. About 1886 he took a long-projected tour to Rome and Greece. He had made an unhappy marriage in America, and his first wife being dead, he married again, equally unhappily, in 1890. In 1897 he again visited Italy, with H. G. Wells, and in 1901 was obliged by his health to settle in the S. of France, where he d. His work is marked by sombre power. Most of his novels deal realistically with suburban life, and certainly portray more of the sordid than the joyous aspects of existence. They are nevertheless inspired by a deeply moral ideal. His works include *Workers in the Dawn* (1880, showing the results of his study in Germany); *The Unclassed* (1884, new ed. 1895); *Isabel Clarendon* (1886); *Demos* (1886); and *Thyra* (1887)—all written from the point of view of a social outlaw—and *A Life's Morning* (1888, his most cheerful novel); *The Nether World* (1889, a gloomy description of semi-starvation); *The Emancipated* (1890); *New Grub Street*

(1891, a study of the effects of want on literary powers); *Born in Exile* (1892, an introspective semi-autobiography); *Densil Quarrier* (1892, new ed. 1907); *The Odd Women* (1892-93, new ed. 1907); *In the Year of Jubilee* (1894); *Eve's Ransom* (1895); *The Whirlpool* (1897); *Human Odds and Ends* (1897); *Charles Dickens: a Critical Essay* (1898); *The Town Trareller* (1898); *The Crown of Life* (1899); *Our Friend the Charlton* (1901); *By the Ionian Sea* (1901); *The Private Papers of Henry Ryecroft* (1903, largely autobiographical); *Will Warburton* (pub. in 1905); and the unfinished *Veranilda*. See Morley Roberts, *The Private Life of Henry Maitland*, 1912, and *The Letters of George Gissing*, 1927; S. Alden, *George Gissing: Humanist*, 1922; R. C. McKay, *George Gissing and his Critic*, Frank Swinnerton, 1933. See also lives by F. Swinnerton, 1913; E. Gissing, 1927; G. Roberts, 1930; and S. V. Gapp, 1936.

Giuliano della Rovere, see JULIUS (popes), *Julius II.*

Giuliani, Giambattista (1818-81), It. philologist, b. near Asti in Piedmont, and devoted the greater part of his life to Dante. He became prof. of moral philosophy at Genoa, and ultimately succeeded to the chair of rhetoric 'n' the same tn. He removed later to Florence. His chief works are *Le Norme di Commentare la Divina Commedia* (1856), and *La Vita Nuova e il Canzoniere di Dante* (1863).

Giugliano, It. tn. in Campania, 6 m. to the N.W. of Naples. Pop. 17,000.

Giulianova, coast tn. of Teramo, Italy. It is linked by rail with tn. of Teramo. In the Second World War the fine Romanesque church of St. Maria was ruined.

Giulio Romano (Giulio Pippi de' Gianuzzi) (1492-1546), It. painter and architect, b. at Rome; studied under Raphael, assisting him in sev. works, including 'Benefactors of the Church,' in the Incendio del Borgo, and the 'Apparition of the Cross,' in the Vatican. This last was one of a series in the Hall of Constantino, with the completion of which he was entrusted on Raphael's death. He succeeded Raphael as head of the Rom. school of painting. Among his early architectural works is the Villa Madama, with its fresco of Polyphemus. In 1521 Federigo Gonzaga, duke of Mantua, invited him to undertake numerous renovations and decorations in that city. Here he drained the marshes and made provision against periodic floods; restored the palazzo del Te, the cathedral, a ducal palace at Marmirolo and numerous minor buildings, and did much pictorial work, including the 'History of Troy,' 'Psycho,' 'Tearus,' and 'The Titans.' Later he designed the façade to the church of St. Petronio at Bologna. Among his other works as a painter are 'The Martyrdom of St. Stephen' (Genoa), 'Holy Family' (Dresden), 'Mary and Jesus' (Louvre, Paris), and 'Madonna della Gatta' (Naples). His style is distinguished by freedom and animation. See lives by D'Arco, 1842, J. P. Richter, 1928, and G. Vasari, *Lives of the Painters* (Eng. trans. by J. Foster, 1850).

Glura, see GYAROS.

Giurgevo, or Giurgiu, tn. of Rumania in

Wallachia, on the l. b. of the Danube, opposite Rustchuk, 40 m. S.W. of Bucharest. The tn. was founded by the Genoese in the fourteenth century, was destroyed by the Russians in 1829, and recaptured by the Turks in 1854. It has a large trade in petroleum, salt, and grain, and is the headquarters of commerce between Rumania and Bulgaria. There are also large saw-mills. Oil wells at G. were bombed by the Allies on June 23, 1914, and the place fell to the Russians soon in their offensive in Aug. Pop. 24,000.

Giusti, Giuseppe (1809-50), It. satirical poet, b. near Florence, and early began a brilliant series of poems denouncing the enemies of Italy and her own internal vices. In 1818 he became a member of the Tuscan Chamber of Deputies. Among his friends were Capponi, Manzoni, and D'Azeglio. He was actively sympathetic with the Liberation movement, but his temperament inclined him to moderate liberalism, and he was considered by some of his countrymen, e.g. the 'Young Italy' party, to be a reactionary. His poems include *La Ghigliottina* (The Guillotine, 1833), written while he was still a student; *Il Dies Irae* (1835), on the death of the Emperor Francis I.; *Lo Stirale* (1836); *Il Brindisi di Grolla* (1840); *Gli Umanitari*; *Il Papato di Prete Pero*; *Gingillino*; and *Saul*. *Ambrasio* (1846). See monographs by Susan Horner, 1864; G. Floretto, 1877; and Leonardi, 1887. The Amer. writer W. D. Howells trans. Giusti in *Modern Italian Poets*, 1887.

Givency, or Givenchy-lez-La Bassée, vil. in the dept. of Pas-de-Calais, France, 2 m. W. of La Bassée, which was the scene of severe fighting in the First World War. In the battle of the Lys (q. r.), April 1918, the G. sector was the key to the whole situation on the S. front of the Ger. attack, and the position there had become especially critical by reason of the withdrawal of the Portuguese from the battle, thereby leaving the 5th Brit. Div. unsupported. This famous div. held an organised line of 11,000 yards, and this successful defence undoubtedly saved Bethune. Earlier in the war G. was occupied by Indian troops, who were heavily attacked by the Ger. in Dec. 1914. There was also fighting at G. in 1915 during the battle of Loos (q. r.). Pop. 1100. See G. A. B. Dewar, *Sir Douglas Haig's Command*, 1922.

Givet, tn. of France, in the Ardennes, it stands on the Meuse and the Canal de l'Est, 10 m. N.E. of Mézières, and near the Belgian frontier. It is a busy manufacturing and trading centre with metallurgical and other factories. There are blue marble quarries near by. An old citadel, built by Charles V. on a height above the tn., is the only remnant of its anc. fortifications. Pop. 6800.

Givors, Fr. tn., dept. of the Rhone, situated 14 m. S.W. of Lyons on the r. b. of the Rhone. It manufactures iron, bottles, and glass, and is also a centre of the coal-mining industry. Pop. 13,200.

Giza (Gizeh): 1. Prov. of Upper Egypt. Area about 400 sq. m., with a pop. of

822,400. 2. Tn. situated on the l. b. of the Nile, some 3 m. S. of Cairo. It is near the Pyramids, which are about 5 m. to the W. The Sphinx and the ruins of Memphis are also in the immediate neighbourhood. An electric railway runs to both of these and also to the Pyramids. The Egyptological museum which used to be here is now removed to Cairo. The Nile is crossed at this point by a bridge. Pop. 66,000.

Gjellerup, Karl Adolf (1857-1919), Dan. author, b. at Roholte, Zealand. His works are varied; including poetry, fiction, dramas on which he was least successful, and criticism. Among them are *En Idealist* (1879), written under the pseudonym of 'Epigonus'; *Det Unge Denmark* (1880); *Germanæres Larung* (1882) all three novels; *Rodtjorn* (1882), a collection of poems showing his radical tendencies; *Aander og Tider* (1882), addressed to Darwin; *Brynhild* (1884), a tragedy; *Fandreakret*, a series of reflections; four dramas, viz. *Saint Just* (1886); *Thamgris* (1887); *En Arkadish Legende* (1887); *Hagbad og Signe* (1888); *Romulus* (1890), a novel; *Richard Wagner i hans Hovedverk Nibelungen Ring* (1890); *Herman Vandell* (1891), a tragedy; and *Minnan* (1893), a novel. He gained a Nobel prize, 1916, 17.

Gjinokaster, see ARGYROCASTRO.

Glaiber, Raoul or Rodolphe (d. 1850), Fr. historian and monk of Cluny, b. at Auxerre. His *Historia*, in five books, extending from 900 to 1046, was first pub. by P. Pitton in 1596.

Glabrio, Acilus, see ACILIUS GLABRIO.

Glace Bay, seaport of Cape Breton Is., situated on the N.E. coast of Nova Scotia, and the most easterly port of Canada (excluding Newfoundland). It is the centre of the richest coal-mining area in Canada, and is also an iron-mining dist. It is a good harbour and there is deep-sea fishing. There is an airport about 3 m. from the tn. There are twelve churches, thirteen schools, and two hospitals. The tn. owns the electric light and water systems. A Marconi wireless station for the transmission of transatlantic messages has been erected here. Pop. 28,000.

Glacial, or Pleistocene, Period (Gr. *glaikos*, moist, and *kainos*, new), or Ice Age, the names usually given in geology to the latest div. of time immediately preceding historic time - and following upon the Neocene period. The terms Earlier Post-tertiary or Quaternary era are also used with the same meaning. Glacial period and Pleistocene period are practically synonymous as regards N. and temperate regions, the former referring rather to the climatic characteristics of the age, the latter to its form of life. The chief peculiarity of the time was the marked fall of temp., and the cold conditions of N. Europe and America were similar to those of the polar region of the present day. Great mt.-glaciers and ice-fields appear to have formed and gradually advanced southwards, filling the riv. and lake basins, and submerging ints. and lowlands alike. Many geologists believe in sov. great submergences during the G. period. Only

in the nineteenth century was much attention given to the subject. The three chief stages in our knowledge of G. formations and causes are sometimes known as the diluvial hypothesis, the drift hypothesis (started by Lyell), and the ice-sheet hypothesis.

An enormous mass of ice covered Canada and N.E. U.S.A., reaching E. to the Atlantic, and S. even below the region of the Great Lakes and New York. The White Mts., Catskills, and Adirondacks, as well as the Rockies on the W. and the Sierra Nevadas, all show signs of former G. activity, while the glaciers of Alaska and Brit. Columbia were so vast as to form almost single continuous field. In the old world the ice-sheet spread from Scandinavia to N. Germany, blocking up the Baltic Sea, and northward to Great Britain, across the North Sea, finally reaching to Ireland and the Atlantic. Rocks found in the fen dist. and off Flamborough Head remain as proof of the spread of the ice to the But. Isles from Norway before its final melting. The thickness of the sheet has been estimated at some 5000 ft. On the Continent the area covered was about 800,000 sq. m., sev. times larger than the Greenland ice-cap. Small glaciers and snow-fields extended as far S. as the Carpathians and Alps, and to the ranges and Central Plateau of France. The general tendency of all these ice-masses was to move downwards, and from the Scottish Highlands they diverged in both directions, W. and E. to the Outer Hebrides from Ross and Inverness, and to the North Sea from Moray and Aberdeen. The flow eastward was checked by the great Scandinavian sheet which pressed upon the Yorkshire coast and finally forced the Scottish ice N.W. to the Atlantic by way of Caithness and the Orkneys. Part of it also flowed down the Clyde valley, reaching N. Ireland, S. Wales, and the Eng. Midlands, where boulders of Ailsa Craig granite have been found. The present Alpine glaciers are merely humble remains of the mighty ice-sheet which once covered all Switzerland. The former existence of glaciers is proved partly by certain deposits and partly by the peculiar character and formation of the surrounding country. The deposits consist of moraine materials, erratics, marine, fresh-water, and terrestrial accumulations, the most important substance being boulder-clay or 'till.' This is an unstratified clay full of ice-worn stones and boulders, supposed to have been formed under glacier ice. There are often sev. distinct layers of boulder-clay, separated by 'interglacial beds.' The lowest and oldest layer covers a vast area, extending S. to the Bristol Channel and Thames valley in England, and to the foot of the Hartz Mts. in Germany. Similar deposits are met with in Switzerland and the Alpine regions, the Apennines, the Corsican Mts., the Sp. Sierras, the Pyrenees, the mt. ranges of France and Germany, and the Carpathians. The rock surfaces beneath are smoothed and striated, or scratched and crushed. Other characteristic deposits are erratics,

askers, or kames, Giants' Kettles, and clays with Arctic marine shells (especially in Scotland and Prussia). There are numerous lakes in glaciated regions, the streams have exceedingly irregular courses, and relatively there is little continuity of slope. Many of the lakes of N. Europe and America originated in the G. period, and those of pre-G. origin were considerably expanded. Lake basins were scooped out by erosion, and the ice-sheet by obstructing valleys in its retreat formed temporary lakes. One such temporary basin spread from N. Minnesota and N. Dakota far into Canada. The lochs of Scotland and the fjords of Norway were very probably largely produced by the erosive action of ice. The soil of glaciated regions is not derived from the disintegration and decomposition of the rock below, but from material or 'drift' carried down from elsewhere. This, unlike alluvium, has some boulders of great size, and its materials are not generally rounded and sorted, but rather of rough, uneven surface, with numerous knolls and un-drained hollows. Evidence of former glacial conditions has been found also in the Caucasus, Asia Minor, India (Asia Proper), parts of Africa and S. America, and in New Zealand.

The changes of climate during the G. period were accompanied by migrations of the fauna and flora of the Arctic and temperate zones. As the temp. fell, animals and plants moved from the polar to the tropical regions, returning poleward again with the rise of temp., or seeking refuge on the mt. tops. Thus the climatic changes saw a series of corresponding variations of life forms in the different regions.

Terminal moraines (1200 to 2000 ft. high) of glaciers are to be seen in a great amphitheatre round Italy on the Piedmont plains. The plains of France, Italy, Spain, S. Russia, and England S. of the Thames were not covered by any entire ice-sheet, but were frost-bound during a great part of the year. A detailed study of G. deposits tends to show that the ice must have advanced and retreated again more than once. The exact number and extent of these fluctuations is still a matter for discussion, and different views are held. Some geologists believe in as many as five epochs of glaciation with four interglacial intervals, others only in one.

The true causes of the cold climate of the Ice Age are still much discussed, and many different theories are held. These can only be mentioned briefly here. Some believe it to have been the result of astronomical changes (James Croll and Prof. Ball among others); others of terrestrial changes. Another theory ascribes it to variations in the quantity of heat radiated by the sun, supposing the latter to be a variable star. Changes of level of land and sea, perhaps accompanied by a diversion of the Gulf Stream across the Isthmus of Central America to the Pacific or by submergence of the Panama Isthmus, have also been suggested. One widely spread explanation is based on the relative positions of the earth and the

sun at distant periods of time. The eccentricity of the earth's orbit is subject to gradual and irregular variations. With a maximum of eccentricity the earth is 14,000,000 m. nearer the sun during perihelion than in aphelion, the difference in the amount of heat received from the sun being about one-fifth. See also GEOLOGY and GLACIERS.

For detailed study of the subject see Sir C. Lyell, *Geological Evidences of the Antiquity of Man*, 1863; J. Geikie, *The Great Ice Age and its relation to the Antiquity of Man*, 1874, and *Earth Sculpture*, 1898; W. B. Dawson, *Early Man in Britain*, 1880; J. Croll, *Climate and Time in their Geological Relations*, 1885; A. Heim and A. Penck, *On the District of the Ancient Glaciers of the Isar and Linth*, 1886; Sir H. Howarth, *The Mammoth and the Flood*, 1887, *The Glacial Nightmare and the Flood* (i., ii.), 1893, and *Ice and Water* (i., ii.), 1905; Sir R. Ball, *The Cause of the Ice Age*, 1891; W. Wright and T. Chamberlin in *The American Journal of Science*, 1892-93; H. C. Lewis, *Papers and Notes on the Glacial Geology of Great Britain and Ireland*, 1891; A. Penck and E. Brückner, *Die Alpen in Eiszeitalter*, 1901-6; F. Smith, *The Stone Age in N. Britain and Ireland*, 1909; A. P. Coleman, *Ice Ages, Recent and Ancient*, 1926; K. Mason, *Glaciers of Karakoram*, 1930; R. A. Daly, *Changing World of Ice Age*, 1935; and R. F. Flint, *Glacial Geology and the Pleistocene Epoch*, 1947. See also writings of J. Scheuchzer, Kuhn, H. B. de Saussure, J. von Charpentier, A. Agassiz, and J. Ramsay. For further references to literature see A. Genk, *Text-book of Geology*, n. (4th ed.), 1904, and T. Chamberlin and R. Salisbury, *Geology* (iii.), 1906.

Glaciers (Fr. *glacier*; Ger. *Gletscher*), name given to rvs. of snow compacted by pressure into ice. This mass of ice has its origin in the hollows of mts., where perpetual snow accumulates; it moves slowly from higher to lower levels, making its way down towards the lower valleys, where it gradually melts. Not infrequently it reaches the borders of cultivation and has been known even to sweep away vls. in their course. A glacier moves at the rate of 18 to 24 in. in a space of twenty-four hours. It is steep and inaccessible at its lower end, but the middle part of its course is more level, though it becomes steeper again towards its source. The ice of which G. are composed differs from that produced by the freezing of still water, being composed of numerous thin layers, more brittle and less transparent than ordinary ice. A glacier usually descends into a valley, far amidst a wilderness of stones borne down upon its surface, the earthy, rocky rubbish being termed a moraine. In tropical and temperate climates G. are found only upon the higher parts of lofty mts., but at the poles great is, and whole continents are partially and sometimes entirely covered by them. G. have many features in common with rvs. They have regular drainage areas from which they draw

their supplies, they carry along with them in their course rocks, sand, earth, gravel, etc., they reach the ocean in the forms of ice or water, and they convey their burdens of earthy matter to the sea their influence upon marine deposits being very considerable. The distribution of G. is very extensive. They are to be found in Greenland, which is almost an entire sheet of ice in N America in Alaska and dotted along the Pacific coast. They also occur in Europe Norway among the Pyrenees and along the Alps and traces of their presence in past geological ages are general appearing over the larger part of N America and all N Europe. The unexplored Antarctic continent is to all appearance covered by one huge ice sheet over 10,000 ft thick. Of the 11, G. in the Alps perhaps the most remarkable is the lower glacier of the Aar. It has been estimated to have a depth of about 1510 ft and is one of the most remarkably even and accessible G. in all Switzerland. The slope of its surface is in many places only 3° . Such level and easily crossed spaces are also found about the middle regions of the Mer de Glace and in the lower glacier of Grindelwald and it is in such portions of a glacier that internal cascades or *moulins* occur. They arise from the surface water being collected into a considerable mass by a long course over its unbroken surface and then hurled with force into the first rivulet with. A channel is kept open by the descending cascade which at length loses the form of a fissure taking on that of an open shaft sometimes of enormous depth. The middle region of the great G. of the Alps extends from the level of about 6000 to 8000 ft above the sea beyond 8000 ft the snow line is reached. Fresh snow annually disappears from the glacier proper and where it ceases entirely to melt it naturally becomes incorporated with the glacier. Everywhere below this region therefore the glacier melts but here it forms. In fr this snowy region is known as *nerv* in Ger as *lern*.

As ascended, the glacier gradually changes from the state of ice to the state of snow. The outer layers are nearly pure snow but the deeper ones have more consistency and break into large fragments which at Chamonix, are called *séracs*. The ice of the glacier proper has a very peculiar structure quite distinct from the stratification of the snow on the *nerv*. It has a remarkable veined or ribbed appearance explained by Prof. Forbes as being the result of internal forces by which one portion of ice is dragged past another in a manner so gradual as not necessarily to produce large fissures in the ice but effecting a general bruise over a considerable space of the moving body.

The delicate veins in the G. have their course in a parallel direction to that of the sliding effort. One portion of the ice over another longer described a glacier as 'an imperfect fluid or viscous body which is urged down slopes of a certain inclination by the mutual pressure of its parts,' but this 'plastic theory' has been objected to, in that ice is by its

nature a brittle solid and not sensibly possessed of any viscous or plastic quality. One of the most important contributions to the solution of this problem was made by Prof James Thompson, when he predicted that the freezing-point of ice must be lowered by pressure, and in this manner explaining the 'viscous' theory of Forbes. But in spite of the observations made by these two men and by Tyndall and others the real cause of glacier motion cannot yet be considered as satisfactorily solved.



D. McLeish

SÉRACS IN A GLACIER IN THE DAUHINTE ALPS

Moraines previously referred to are one of the most remarkable phenomena connected with the work of G. They are accumulations of stones and débris either piled up on the sides of the glacier or scattered along their surface, and have been detached from the sides of the valley or ravine forming the bed of the glacier by the action of ice.

The fissures or crevasses by which G. are traversed present another phenomenon. They are frequently over 100 ft in depth and often covered with snow, thus adding considerably to the beauty and wonder of Alpine scenery, though they are, at the same time exceedingly dangerous to travellers. G. abound in Switzerland the Tyrol, Piedmont and Savoy, but it is chiefly in the chain of Monte Rosa that they are exhibited in their greatest sublimity.

Gravel cones are occasionally seen on the surface of G., and these are closely connected in origin with the *moulins* already referred to. The glacier of Aar

has examples of these singular cones, but they are comparatively rare on most others.

Glacier tables are another striking phenomenon produced by a similar protective action of large stones, which have become detached from the moraines and lie on the surface of the ice, giving it the appearance of a table. See also DEPOSITION.

See H. B. de Saussure, *Voyages dans les Alpes*, 1780-96; A. Agassiz, *Système glaciaire*, 1847; Prof. Forbes (trans.), *Théorie des glaciers de la Savoie*, 1875; J. Tyndall, *Glaciers of the Alps*, 1890; L. Rémond, *12,000 ans*, 1903; C. Wright and R. Priestley, *Glaciology*, 1922; A. E. Tuttou, *The Natural History of Ice and Snow*, 1927; W. Flüg, *Das Gletscherbuch*, 1938; and H. Ahmann, *Glaciological Research on the North Atlantic Coasts*, 1949.

Glacis, open space of ground round a fortress, sloping gently down from the covered way to the country. The insurgents are obliged to pass over it in approaching the fort, and thus expose themselves to open fire from the defenders.

Gladbach, or Bergisch-Gladbach, tn. in the Rhineland, Ger., abt 9 m. E.N.E. of Cologne. Chief industries include iron, steel, and zinc works, paper and papier-mâché works. Coal is worked. Pop. 20,400.

Gladbach, München-Gladbach, or Mönchen-Gladbach, manufacturing tn. 16 m. W. of Düsseldorf, Rhineland, Germany. It has a fine Gothic church, the crypt of which dates from the eighth century. The building sustained some damage during the fighting of 1945. G. was the centre of the Rhineish cotton industry; there were many dyeing, calico-printing, weaving, and spinning works. The tn. grew up round the Benedictine abbey founded in the eighth century and dissolved in 1802. In the Second World War it was the first considerable industrial tn. to be captured by the Allies in their advance to the Rhine. The Amer. First Army secured communications between G. and Aachen early in Feb. 1945. Towards the end of the month that army pushed towards Cologne, while the forces of the Amer. Ninth Army were directed towards G. and Grevenbroich. By March 1 both tns. had fallen to the Amers. Pop. 126,000.

Gladbeck, tn. in the prov. of Westphalia, Germany, about 8 m. N. N.W. of Essen. The chief industries before the Second World War were the manuf. of cement and coal-mining. Pop. 61,200.

Gladiators, professional swordsmen who in ant. times fought to provide public entertainment. The custom of gladiatorial fights is supposed to have come from the E. and to have been borrowed by Rome from the Etruscans. Its origin is probably to be found in the practice of honouring heroes who had d. in battle by sacrificing the lives of captives. The practice spread to the funerals of all important men, the sacrifice being rendered more interesting to the spectators by the captives killing each other,

and it later still became an independent form of public amusement. The first gladiatorial fight in Rome of which we have knowledge took place in 264 B.C., being arranged by Marcus and Decimus Brutus for their father's funeral. In 217 B.C. Scipio Africanus arranged an exhibition at New Carthage; in 207 B.C. twenty-four pairs of G. fought in the Forum; while Julius Caesar, Titus, and Trajan all gave huge gladiatorial shows. Augustus made some attempt to limit the number of such exhibitions, but they had become so popular that this was impossible. They were unsuccessfully prohibited by Constantine in A.D. 325, and finally abolished by Theodosius (A.D. 500). The G. were either slaves, prisoners, or criminals, who were bought and trained for the business, or free-men of the lowest class who fought for hire. They were sworn to fight to the death and any show of cowardice was punished with death by torture. The defeat of one of the combatants was marked by a cry of 'Habent!' from the spectators, who then decided his fate, turning their thumbs downwards if they wished him to be killed by the victor. The victor was rewarded with a branch of palm and sometimes received his freedom. There were sev. types of G., such as the *andathæ*, who fought blindfolded; the *mirmillones*, who fought with sword and shield; the *retiarii*, who had, as weapons, a net and a three-pronged lance; and the *Thraeces*, who used a short sword and a round buckler. They were occasionally mounted. Discharged G. were known as *rudarii*, from the *rudis*, or wooden sword, with which they were presented. The practice of gladiatorial fights never found much favour in Greece.

Gladiolus, name of a genus of Iridaceæ, which comprises many beautiful species, sev. of which are European. *G. communis*, the foxglove sword-lily, is frequently introduced into Eng. gardens; *G. cardinalis*, the red sword-lily, and *G. gaudens*, a hybrid form, are natives of the Cape. There are numerous new hybrids, and the species *Bronchleyensis*, *Lemoinei*, and *Primulinus* give gardeners an ample choice.

Gladstone, Herbert John, first Viscount (1834-1930), Brit. administrator: youngest son of Wm. Ewart G., educated at Eton and Univ. College, Oxford. He was private secretary to his father, 1880, in which year he entered the House of Commons. In 1891-95 he was chief commissioner of works, and from 1899 to 1905 chief whip to the Liberal party. He became home secretary in 1905 and held that position until 1909. In the following year he was appointed first governor-general of S. Africa. He wrote *W. E. Gladstone* (1918) and *After Thirty Years* (1928).

Gladstone, John Hall (1827-1902), Eng. scientist, b. at Hackney; educated at Univ. College, London, and at Göttingen. From 1874 to 1877 he was Fullerian prof. of chem. at the Royal Institution; in 1871 became first president of the Physical Society. His pub. works include *Life of*

Michael Faraday (1872), written from close personal knowledge; *Miracles as Credentials of Revelation* (1873); and *Chemistry of Secondary Batteries* (1883).

Gladstone, William Ewart (1809-98), Brit. statesman, b. on Dec. 29 at Liverpool, the fourth son of John G., a Liverpool merchant of Scottish descent, a member of the family of Gledstanes of Lanarkshire. His father sat in Parliament from 1818 to 1827, and was created a baronet in 1846. He was educated at Eton and Christ Church, Oxford. At Eton he was contemporary with a number of brilliant young men, and he took an energetic part in the debates of the Eton Society to which he was elected a member in 1825. He was also co-founder of the *Eton Miscellany*, which he ed. during his last two terms. At Oxford he took a double first in classics and mathematics. While an undergraduate his political and theological interests began to show themselves. He founded an Essay Society, and in 1830 became president of the Oxford Union. He frequently took part in the debates on political subjects. He defended Catholic Emancipation and attacked the Reform Bill in a speech so magnificent that Charles Wordsworth, with whom he read classics, ventured a prophecy that he would become Prime Minister. G. now wished to take holy orders, but his father insisted that he should enter Parliament. John G. had influence with Peel, and his son was, at the instance of the duke of Newcastle, returned (Dec. 1832) to the first Reform Parliament as one of the members for Newark. He sat in the House of Commons until his retirement in 1895, except in 1846, when he was secretary of state for the colonies. G. made his maiden speech on June 3, 1833, and this was favourably received. In this speech he advocated the abolition of slavery in Brit. dominions, and at the same time defended his father from a charge of cruelty to the slaves working on his estate in Demarara. When at the end of the next year Peel became Prime Minister, he appointed G. as junior lord of the treasury, a nomination due to John G.'s connection with Peel rather than to the young man's ability, of which as yet he had given no remarkable proof. He was promoted under-secretary of state for war and the colonies in Jan. 1835, but the ministry went out in the following April. Being out of office G. devoted himself to his favourite studies. Stimulated by the Oxford Movement with which he was sympathetic, both from conviction and through his friendship with Manning, then still a minister in the Church of England, he pub. in 1838 his famous book, *The State in its Relations with the Church*. It was an immediate sensation and aroused considerable controversy. Macaulay in the course of a critical review referred to its author as 'the hope of the stern, unbending Tories.' In the winter of 1838-1839 G. was in Rome. There he became engaged to Miss Catherine Glynne, daughter of Sir Stephen Henry Glynne of Hawarden, Flintshire, and in her issue heir to her brother, Sir Stephen

Glynne, ninth and last baronet. The marriage took place at Hawarden on July 25, 1839. In the general election of 1841 G. was again returned for Newark. Peel formed his second administration, in which G. was vice-president of the board of trade. G. was committed to protection and drafted the revised tariff of 1842. He now showed his consummate mastery of financial and commercial matters. Two years later he became president of the board of trade and entered the Cabinet. Peel's policy of placating the Irish Catholics by increasing the grant to the Catholic training college of Maynooth presented G. with a difficult decision. He wished to support the measure, but felt he could not do so as a member of the gov. because it ran counter to the principle he had expressed in his book. As a private member he considered he was free to change his opinions. He resigned, and his action was widely and wrongly construed as a piece of unnecessary 'political prudery.' In Dec. 1845 he returned to office as colonial secretary under Peel. Peel had been converted to free trade as being in his opinion the only means of averting famine in Ireland. His repeal of the Corn Laws caused a violent split in the Tory party. G.'s increasing mastery of financial affairs also led him to free trade. As a result of his adherence to Peel he gave up his seat for Newark, in which he had been the nominee of the duke of Newcastle, an unyielding protectionist. Thus during his colonial secretaryship he was not in Parliament. In the general election of 1847, however, he was returned for the univ. of Oxford. Peel d. in 1850, leaving a small 'third party' within the Tory ranks. G. remained a Peelite, and the leadership of the Tory party passed him by. In the period which followed his attention was turned to foreign affairs. He crossed swords with Palmerston, the foreign secretary, who nearly precipitated a European war in defence of Don Pacifico, a Maltese and a Brit. subject who had suffered at the hands of the Greek Gov. G. now, as in the future, stood for moral right in dealings with other countries. A visit to Naples in the autumn of 1850 led him to take up the cause of the oppressed subjects of the Neapolitan Gov. His letter of April 7, 1851, to Lord Aberdeen on this subject made him an international figure. In domestic policy he again came to the fore with his masterly impromptu speech, denouncing the budget introduced by Disraeli, then chancellor of the exchequer. This contributed to the fall of Lord Derby's gov. Lord Aberdeen succeeded him with a coalition of Whigs and Peelites. G. became chancellor of the exchequer, and his great speech on the introduction of his first budget on April 18, 1853, established his reputation as a financier beyond question. When Lord Aberdeen went out of office on the question of the mismanagement of the Crimean war, the Whig and Peelite partnership continued under Palmerston, with G. again as chancellor. The gov. was pledged to withstand the move for a select committee to inquire into the conduct of the Crimean war.

Palmerston gave way, however, and the Peelite members including G., resigned (Feb 1855). There followed for G. a period of political independence, which in the eyes of many appeared to jeopardise his political future, but was in reality a time of growth confirming his leanings towards Liberal principles. Lord Derby, who succeeded I. M. in 1858 attempted to bring G. into the gov. but he declined a position which would have made him a colleague of Disraeli then Chancellor and leader of the House of Commons. In that year he went, at the request of Sir F. D. Bulwer Lytton, then secretary for the colonies on a special mission to the Ionian Is. but could not



WILLIAM EWART GLADSTONE

stem the agitation for incorporation with the kingdom of Greece. When I. M. returned to power in 1858 G. accepted office as Chancellor of the Exchequer and this finally marked his adherence to the Liberal party. He continued as Chancellor under Lord Russell with whom he was as much in sympathy as he was at odds with I. M. In the general election of 1865 he lost his seat for Oxford, his future having become increasingly uncertain as his conversion to Liberalism became confirmed. His severance from Oxford was a matter of great personal regret for him. He stood for S. Lancashire and was narrowly elected. On the death of I. M. in 1868 Lord Russell became Prime Minister. G. was again Chancellor but with the added responsibility of being leader of the House. The gov. fell however on the issue of the Reform Bill. In rejecting this measure Parliament was out of touch with the people and G. in defeat became a popular hero. His prestige did not suffer when the Tory administration which followed in 1868 introduced a Reform Bill similar in scope

to his own. The Bill as finally passed owed much to the amendments which G. had forced upon it. On the retirement of Lord Russell in 1867, G. succeeded to the leadership of the Liberal party. The following year the retirement of Lord Derby made Disraeli Prime Minister, and thus the two great protagonists became the leaders of their respective parties. By the end of the year Disraeli's gov. resigned. The Liberals won the ensuing election on the issue of the disestablishment of the Irish Church. G. defeated in S. Lancashire was returned for Greenwich. On Dec. 9 1868, he became Home Minister for the first time. He remained in office until 1874. The disestablishment of the Irish Church, the Irish Land Act, the Education Act introducing compulsory national elementary education and the Poor Law Act were among the great domestic measures of his gov. While his handling of the *Alabama case* (*q.v.*) was an example of his insistence on moral right rather than force in international affairs, it failed however with the Irish Univ. Bill (1873), a measure dear to his heart in his efforts to compose the differences of Protestant and Catholic in the service of higher education. G. resigned, but resumed office as no alternative gov. offered. The administration was however less active and in Jan. 1874 G. announced the dissolution of Parliament. In the general election the Liberals were to their surprise defeated by himself only narrowly retaining his seat for Greenwich. He felt his work was done and in the belief that early retirement from politics was beneficial for the country he announced a decision which he had long meditated: his resignation from the leadership of the Liberal party. He devoted himself to his theological studies and it so happened at this time that the welfare of the church was in his view threatened by the Public Worship Regulation Bill sponsored by Archbishop Tait, the object of which was to abolish ritual. G. felt it compelled to come out publicly in favour of moderate ritual. His article on ritual and ritualism appeared in the *Contemporary Review* in Oct. 1874. The controversy led him at length into an attack on Roman Catholicism and to the outcry then raised he replied in the pamphlet *The English Clergy in their Hearing on Civil Allegiance*. His full return to public life came as the result of his vigorous denunciation of the atrocities perpetrated by the Ottoman Empire upon the Bulgarians. He was thus in direct conflict with Disraeli's pro-Turkish policy. He was also opposed to Disraeli's imperialism which resulted in the Afghan war of 1878-79. G. aroused the conscience of the country, and the Conservatives were defeated in the elections of 1880. Lord Hartington, the Liberal leader retired in G.'s favour. G.'s second administration lasted from June 1880 to June 18 — a turbulent five years which frustrated the Liberal policy of 'peace, retrenchment and reform'. G.'s sympathy for a people struggling for independence persuaded him to treat with the Boers who had defeated the Brit. at

Majuba, and the first Boer war was concluded (March 1881) by the Boers being granted independence under British suzerainty. In Irish affairs circumstances impelled G unwillingly towards coercion. Parnell was himself arrested. G's Land Act (1881) failed to pacify the country. Parnell was released on condition of co-operation, but any good which may have come from this abrupt change of policy, which caused dissension in the Liberal ranks, was destroyed by the assassination of Lord Cavendish (q.v.), the newly appointed Irish secretary. Liberal principles were further compromised by the aggressive action in Egypt where the Khedive who was without popular support, was restored by British arms at the battle of Tel el Kebir. Then followed the rising of the Mahdi in the Sudan, the surrender of the Sudan and the death of Gen. Gordon (q.v.). The circumstances of this event excited popular feeling at home against the govt., and G's popularity declined. In domestic legislation however, he was more successful, and he introduced several Irish measures and extended the franchise to agricultural labourers and others. Owing to a defeat in the House of Commons G resigned in 1885, but returned to office for the third time in the following year. He now introduced his long-cherished measure for Home Rule for Ireland. His own party split on the issue. The Liberal Unionists, as the Liberal opponents of Home Rule were called, who included Lord Harrington and Joseph Chamberlain, voted with the Conservatives and the Bill was thrown out on the second reading. An appeal to the country brought the combined Conservatives and Liberal Unionists a majority and Lord Salisbury's govt. lasted until 1892. Then G's vigorous and successful Midlothian campaign brought him back to power. For the fourth time he became Prime Minister. He was now in his eighty-third year. The strain of public life was beginning to tell on his magnificent physique, but he was determined to devote his last years to bringing the Home Rule question to a successful issue. In this he was disappointed. His second Home Rule Bill was put before Parliament in Feb. 1893 and after much controversy was passed by the House of Commons in Sept. It was then rejected by the Lords by an overwhelming majority. This was a bitter blow. He did not dissolve Parliament, however. He continued in office, but with the defeat of his hopes he did not wish for much longer to bear his official responsibilities. He made his last speech in the House of Commons in support of the Parish Councils Bill on March 1, 1894, in which oration he breathed to his followers the task of destroying the vot of the House of Lords. Two days later he resigned the office of Prime Minister. In which he was succeeded by Lord Rosebery. He did not again attend the House of Commons, but he retained his seat until the dissolution on July 8, 1895. He had suffered from failing eyesight, but an operation for cataract restored his vision soon after his retirement. This enabled

him to devote his time to a study of Bishop Butler, whose works he edited. He also published *Studies subsidiary to the Works of Bishop Butler*. The Armenian massacre of 1895 and 1897 moved him so deeply that he again appeared to speak in public with something of his old vigour of denunciation. Illness now, however, began to make itself felt. A visit to Cannes failed to fortify him, and he returned to Hawarden where he had long been at his wish to end his days. This was in March 1898. His health declined rapidly and on May 1, Ascension Day, he died. The nation went into mourning and many thousands attended the funeral which took place in Westminster Abbey where he is buried. His wife, who survived him by two years, also lies there. G was one of the world statesmen of his century. As he said of himself his name stood in Europe as a symbol of the policy of peace, moderation and non-aggression. True in principle, actuated always by a sense of moral right, he believed it was his duty as the leader of a great democracy to understand the will of the people and to fulfil it. Gifted with a deep sonorous voice and fine delivery, he was a magnificent orator. His budget speeches in particular were masterly for their lucidity and grasp of fact. Parliament gave him the occasion for the exercise of his great gifts and he in turn during an age of great parliamentarians enhanced the reputation of Parliament. His service in this respect exceeding that of any other statesman of the century. As a financier he takes his place as a lineage descendant of Walpole, Pitt and Peel. He was one of the best chancellors of the exchequer that England has ever boasted. Many of his taxes were at the time almost as a matter of course, literally opposed, but time has shown the wisdom of most of those he introduced. Events and convictions placed him through much of his career in political antagonism to Disraeli, for whose abilities (bravery and wit) he nevertheless had a great admiration. Courageous, patient and courageous himself, he could admire these qualities in his opponent. The long political opposition also helped to bring out the fire of G's personality and him it took away from the studious aloofness which a retiring nature might have imposed on him and made him a more warmly popular figure than he might otherwise have become. In addition to his numerous public duties G was an indefatigable writer, devoting as much time as he could give to theological and literary studies. He was also a voluminous diarist. Besides the writings already mentioned he published *Church Principles considered in their Results* (1840), *Remarks on Recent Commercial Legislation* (1845) and *The Impregnable Rock of Holy Scripture* (1890), while his *Studies on Homer and the Homeric Age* (1858) and *Homeric Synchronism* (1876) were the results of a life-long study. In his final retirement he also showed his versatility by publishing a rhymed version of the *Odes of Horace* (1894). The official life is by Lord Morley, 1903. Other biographies have been written by G. W. E. Russell,

1891; Sir Edward Hamilton, 1898; Herbert Paul, 1901; and Osbert Burdett, 1927. See also D. C. Lathbury, *The Religious Life of Gladstone* 1910; Mary Drew, *Catherine Gladstone*, 1919; and Viscount Gladstone, *After Thirty Years*, 1928.

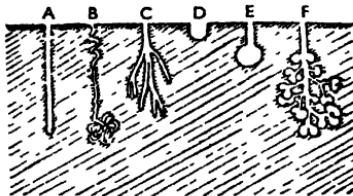
Glaisher, James (1800-1903), Eng. meteorologist, b. in London, worked from 1833 to 1836 at Cambridge Observatory. From 1840 to 1874 he superintended the meteorological dept. of the Royal Observatory. He founded the Royal Meteorological Society, and in the course of investigations into atmospheric humidity, etc., during 1862-66, he reached a height of 7 m. in a balloon. Among his works are *Hygrometric Tables* (1847); *Meteorology of England* (1860); *Scientific Experiments in Balloons* (1863); *Travels in the Air* (1870); *Crystals of Snow* (1872); and several tracts.

Glamis, vil. of Angus, Scotland, 12 m. N. of Dundee. Near it is G. Castle, the seat of the earl of Strathmore, which has a famous traditional hist. It is first mentioned in actual records in the thirteenth century, but Shakespeare, in *Macbeth*, makes it the site of the murder of Malcolm II. in 1034. It is the paternal home of Queen Elizabeth, wife of King George VI. Pop. 1200.

Glamorganshire, most S. co. of Wales, being bounded on the S. and S.W. by the Bristol Channel, on the N. by Brecknockshire, on the E. by Monmouthshire, and on the W. by Carmarthenshire. Area 355 sq. m. The coast to the W. is indented by Swansea Bay, beyond which is the Gower Peninsula. The N. part of the co. is rugged and mountainous, the highest peak being Llangeinor (1859 ft.). These hills are the source of the R. Taff, Ely, Neath, Tawe, Rhymney, and Llwydwr, which flow into the Bristol Channel, and to the S. of them is a large and fertile plain, with a mild climate, containing many richly wooded valleys, one of which, the vale of Glamorgan, is known as the garden of Wales. The industrial prosperity is due to the presence of abundant mineral wealth. Coal is mined at Merthyr Tydfil, Aberdare, Pontypridd, Rhymney Valley, Neath Valley, and Rhondda Valley; there are large blast furnaces at Cardiff, Swansea, Aberavon, Dowlais, Briton Ferry, Port Talbot, Landore, and Merthyr Tydfil; copper, lead, and tin smelting is carried on at Swansea, Neath, and Aberavon, and zinc and nickel are manufactured. Anthracite, coking-coal, ironstone, and limestone are also mined. The co. is Cardiff, and Barry, Swansea, and Port Talbot are flourishing seaports. The co. has seven parl. representatives (Aberavon, Cwmpathilly, Gower, Llandaff and Barry, Neath, Ogmore, and Pontypridd); besides three for Cardiff bor., two each for Rhondda and Swansea bors., one each for Abergavenny and Merthyr Tydfil. Pop. 1,226,000.

Gland. The term G. in its widest sense implies a complex of secreting epithelial cells which form the walls of cavities that are quite distinct from the lymph and blood vessels, and in which the secretion collects. The goblet cells in the lining of

the intestine, secreting mucus, are unicellular Gs. All Gs. present internally a large secreting surface obtained in an immense variety of forms. In all, however, the essentials are an internal cavity or blind canal, a layer of secreting cells, and an enveloping network of capillary blood vessels. The specific characteristics and differences in the secretions depend not on any external and mechanical change, nor upon the anatomical form of the G., but solely upon the specific character of the epithelium which invests the internal secreting ducts. The actual secretory cells vary in appearance according to their previous degree of activity. If the cells have been at rest for some time, they contain very many granules which distend the cells. After continued activity the cells are shrunken in size, and their



DIAGRAMMATIC REPRESENTATION
OF GLAND FORMS

A, simple tubular gland—large intestine; B, coiled simple tubular gland—sweat gland; C, branched compound tubular gland—pyloric glands of stomach, D, L, simple saccular or racemose glands (see INTESTINES), E, compound racemose or sacular gland—pancreas.

contained protoplasm is clearer. Gs. are classified according to their functions as excretory or secretory, lubricatory or digestive. They may also be arranged in groups dependent on their origin as (a) from ectoderm, e.g. sweat and mammary Gs. In some animals specially adapted Gs. occur, as scent, spinning, adhesive, poison Gs., etc.; (b) from mesoderm, e.g. those of kidneys; (c) from endoderm, e.g. those connected with the main part of the alimentary canal. A common form of classification is into types as (a) tubular, simple in large intestine, compound as in pyloric Gs. of stomach; (b) alveolar or saccular, where the secretory portion is much enlarged. These may be much complicated, as in a compound alveolar G. of the pancreas, where there is a growth of still smaller saccular diverticuli growing from the main sacculi. In general the branches of Gs. do not unite, but in one instance, the liver, this does occur, and in this case a reticulated compound G. is produced. The transplantation of the glands of one living organism to another was first attempted by Dr. Serge Voronoff (q.v.) in 1913 at the physiological station of the Collège de France. He proved that by grafting the sex glands (testes) of a young animal (such as a rat, ram, or bull) upon an animal of the same species showing senility he could

rejuvenate his patient and prolong its life. Later by grafting the Gs. (testes) of monkeys upon human beings it was claimed that he renewed in many human subjects their youthful mentality, physical and sexual condition. Dr. Voronoff also grafted the thyroid G. of monkeys in 1913 upon children showing signs of cretinism, and, the cerebral cells of the experimental subjects becoming stimulated by the internal secretion (hormone) of the G., normality was in many cases achieved. In the Brit. character there is a marked repugnance to such forms of grafting, and the operations are not performed in England. The sex Gs. (testes in the male, ovaries in the female) and the thyroid previously mentioned are examples of ductless Gs. (q.r.) or endocrine organs, which pour their secretion, in the form of a hormone, directly into the blood stream, not into a duct. Other ductless Gs. are the pituitary (attached to the brain) and the adrenals, or suprarenals (q.r.) adjoining the kidneys. Lymph Gs. occur at intervals along the lymphatic vessels (e.g. in the groin and the armpit). See also BIOCHEMISTRY. See N. Haire, *Rejuvenation*, 1924, and Dr. S. Voronoff, *The Conquest of Life*, trans. by G. Gibier Rambaud, 1928.

Gland, in botany, an organ which produces more or less peculiar substances termed secreta by a process known as secretion. The secretum may collect in a cavity, or it may be thrown out at the surface (excreted). Solid Gs. occur in the leaves of many saxifragas and crassulas, where chalk is excreted; in many flowers as nectaries, when nectar is the secretum. Hollow Gs. are spaces surrounded by secreting cells, and the secretum may be mucilage, gum, ethereal oil, resin, etc., such as is found in many conifers, oranges, lemons, etc. The milky juice, known as latex, which is found in the dandelion, greater celandine, poppies, etc., is the secretum of Gs. Water-excreting Gs. (hydathodes) occur on some leaves, and digestive Gs. are found in the leaves of the sundew and other insectivorous plants.

Glanders, contagious disease of horses, asses, and mules communicated to man, to whom it is extremely fatal. It is caused by the *Bacillus mallei*, which is expelled in the discharge from the animal's mouth or nostril. It may affect the eye, mouth, nose, or any scratch, crack, or sore with which it comes in contact, and thus enter the blood stream, where in the course of a week or two it produces symptoms. When weakness sets in the lungs are involved, and there are pains in the joints, with fever, thirst, hot skin, and other symptoms of infection of the whole body. When the disease has lasted for some time, the skin becomes affected, when pimplies, pustules, and ulcers form. This form or stage of the disease is known as farcy. There is a popular tradition that if there are only internal general symptoms to which the term G. is applied, or if the skin alone is infected, which, as already stated, is described as farcy, either may be recovered from, but when both conditions are

present the result is fatal; but seeing that the two conditions are nearly always present together sooner or later, the prospect of recovery has no connection with the nature of the symptoms that are first seen. As the disease is a distinctly rare one, it is more often feared than seen. It can only be definitely excluded from a person who has been exposed to infection when symptoms fail to develop, and when examination of the discharge reveals the absence of the bacillus. Inoculation by vaccines is the only treatment that offers any prospect of success. G. is apt to be confused with smallpox, pyæmia, and other forms of blood-poisoning, pneumonia, rheumatism, and various fevers. It is frequently extremely difficult to diagnose the presence of the disease in stable, where half the animals may die before it is even suspected, and the new arrivals have already become affected. Every inducement should be given to owners, by offers of compensation, to report all suspected cases at the earliest opportunity, so that the disease may be stamped out as soon as possible. A preparation by the name of mallein can be obtained from the bacilli and used to diagnose the disease, in the same way as tuberculin is employed to detect tuberculosis.

Glanvill, Joseph (1636-80), Eng. ecclesiastic, b. at Plymouth and graduated at Oxford. In 1660 he became rector of a church at Wimblsh in Essex, and six years later of the abbey church at Bath, and in 1672 was made chaplain in ordinary to Charles II. He was totally opposed to the Aristotelian doctrines. His best-known work is *The Vanity of Dogmatizing* (1661), on a passage in which book Matthew Arnold founded his poem, *The Scholar-Gipsy*. Among his other works are *Lux Orientalis* (1662); *Philosophical Considerations touching Witches and Witches* (1666); and *The Ways of Happiness* (1670). See F. Greenslet, *Joseph Glanvill*, 1900; and H. S. and I. L. Redgrave, *Joseph Glanvill and Psychological Research*, 1921.

Glanvill, Ranulf de (d. 1190), chief justiciar of England during the reign of Henry II, succeeding de Lucy in 1180. He was b. in Suffolk, near Saxmundham, and about the year 1175 he was successful over the Scottish troops under William the Lion. He eventually joined the Crusaders under Richard I, and was killed at Acre. A great lawyer, his chief work was *Tractatus de Legibus et Consuetudinibus Angliae* (c. 1181), an ed. of which was issued by Sir Travers Twiss (1892). In fourteen books, it is valuable as the earliest treatise on the laws of England, and is comparable in its scope to the work of Bracton, though G.'s task was the more difficult in that old local customs, now feudal principles and habits of action, and a good deal of Roman law - then lately made known to England - were in a still earlier stage of being fused into our common law. The trans. of J. Jeannès (1812) has been ed. also by G. Phillips (1827-28) and G. E. Woodbine (1932).

Glapthorne, Henry (1610-after 1643),

Eng. dramatist. Practically nothing is known of his life, but that he was a friend of Lovelace. Most of his works seem to have been written between 1639 and 1643. Among them are *Argalus and Parthenia* (1639); *The Tragedy of Albertus Wallenstein* (1639); *The Hollander* (1640); *Wit in a Constable* (1640); *The Ladies' Privilege*, (1640). He also wrote a poem, *Whitchell* (1643). His collected works were ed. by R. H. Shepherd (1874).

Glarus, or Glaris: 1. Swiss canton, having an area of 261 sq. m. This canton, which contains part of the valley of the Linth, is a mountainous one, its highest point being Mt. Todt (11,887 ft.). The land is mostly pastoral, and some cotton is manufactured. It is specially noted, however, for the manuf. of a green cheese known as Schabziger. Pop. 34,700. 2. Cap. of above canton. It is a modern tn., and from 1506 to 1516 Zwingli was the priest here. Pop. 5200.

Glas, John (1695-1773), founder of the Glasites, was b. at Auchtermuchty in Fifeshire. In 1719 he became minister of Tealing, where he formed the sect which bears his name. It was on account of his book *The Testimony of the King of Martyrs concerning his King* (1727) that he was suspended by the general Assembly. In this book he disagreed with national estabs. in religion, and advocated the principle of independence as being nearer to the teaching of Christ. He was afterwards joined by Robert Sandeman, who became his son-in-law and gave his name to sects in other places who were known as Sandemanians. His works were pub. in 5 vols. (1732-83). *In Account of the Life and Character of John Glas* was pub. in Edinburgh in 1813. See also GLASITES.

Glasgow, Ellen (1874-1915), Amer. novelist, b. Richmond, Virginia. She has written many pieces of fiction dealing mainly with her native state. But she differs from most S. writers in not taking the super-romantic pose about her section. If occasionally she is given to melodrama, at the same time she sees her people with very clear eyes and does not spare them her satire about some of their pretensions. Among her books are *The Love of the People* (1900); *The Battle Ground* (1902); *The Wheel of Life* (1906); *Twenty Liar* (1908); *Life and Gabriella* (1916); *Barren Ground* (1925); *They Stooped to Folly* (1929); *The Sheltered Life* (1932); *Urin of Iron* (1935); *In This Our Life* (1941); and *A Certain Measure; an Interpretation of Prose Fiction* (1943).

Glasgow (from Celtic *geschu*, afterwards *glasghu*, dear green spot-*glas*, green; *ghu*, dear), a co. of a city and port, and is situated in the co. of Lanark, Scotland. The see of a Rom. Catholic archbishop. It lies on both sides of the R. Clyde, which is shut in by the surrounding hills, but the city extends beyond these for a considerable distance. It can boast of having some of the finest buildings in Scotland. Many of them are decorated with the finest marble. They are situated chiefly in the commercial centre of the city. George Square is the prominent square in G. and has been called

the 'Valhalla of Glasgow' because of the many beautiful statues which adorn it. The Cenotaph to the fallen of the two world wars occupies a prominent place in the square. The municipal buildings stand on the E. side of George Square; they were erected in 1889 at a cost of nearly £600,000. They are built in the Venetian Renaissance style and were modelled upon the plans of a young architect, Wm. Young. Besides consisting of an entrance hall, marble staircase, banqueting hall, and council chamber, these municipal buildings include seven apartments for the accommodation of the municipal staff. The General Post Office occupies the S. side of the square, and on the W. is the Italianate building, Merchants' House of G. Notable buildings of G. include the cathedral, univ., art galleries, Kelvin Hall, Provand's Lordship (the oldest dwelling-house in the tn.), Tolbooth Steeple, Royal Exchange, and Stock Exchange. The Royal Exchange, which is in Queen Street, has a news-room furnished with Corinthian pillars supporting a richly decorated roof. David Hamilton is the architect, a G. native, who also designed the Western Club House, as well as other public buildings. The prin. streets run for the most part from E. to W. and are parallel with the riv. The houses are largely built of freestone. The names of the chief streets are Buchanan Street, containing the Stock Exchange and some of the finest shops; Sauchiehall Street, in which the Fine Art Gallery and the old Art Gallery are to be found; and Argyll Street, which is the busiest commercial thoroughfare, and which leads to Trongate, the oldest portion of the city. The other chief shopping streets are Union Street, Gordon Street, and Renfield Street. The Trongate steeple, a relic of mediæval-n., is to be seen at the E. end of Trongate, and a little further on the cross and city hall are approached.

The cathedral is situated N.E. of the city on a height overlooking the Molendinar stream. St. Kentigern, called also St. Mungo, founded a bishopric on the banks of this stream about 560, after which period hist. is silent for a space of five centuries. The see was restored by David, prince of Strathclyde, in 1115, and his preceptor John Achatus, bishop of G., laid the foundation, of a cathedral in 1133 (consecrated in 1136), which was, however, replaced by the present construction by Bishop Jocelyn in 1175. It was left to Bishop Bondington to complete the main part of the building, the cost of which was borne by Connyn, lord of Kilbride, and his lady, during the reign of Alexander II. The memory of these four persons is perpetuated by carved bosses of their heads, which are to be found in the vaulting of the Lower Church. In the fifteenth century, Bishop Blacader raised the beautiful wood screen, together with the unfinished S. transept, which was built over the anc. burying ground consecrated by St. Ninian in A.D. 399. Under the central vaulting of the Lower Church or Leigh Kirk St. Mungo is buried,

and his well is still to be seen near by Of the twelve pre Reformation cathedrals in Scotland St Mungo and St Magnus in the Orkneys were the only ones to escape destruction during the Reformation in the sixteenth century The cathedral is in an excellent state of preservation Its style of architecture is Early Eng , and it is built in the form of a Lat cross with imperfect transepts Originally it consisted of three churches one of which is its famous crypt with its pillars and

Of its museum was founded in memory of the celebrated Dr Wm Hunter of London in 1783 who bequeathed his splendid collection of coins medals etc to the principal and profs The museum contains a remarkable collection of anatomical preparations zoological and mineral specimens MSS books and pictures The univ also owns an observatory and botanical garden The students reside outside the college and those in the



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GLASGOW CATHEDRAL THE CRYPT

The crypt was originally a separate church the Laugh Kirk In the centre of the picture is St Mungo's tomb

pointed arches The crypt was then called Laugh Kirk The windows of the cathedral are of stained glass some of which were manufactured in Munich whilst those in the crypts and chapter house were executed by various British and foreign artists

The Univ of G occupies a prominent position, standing on the top of Gilmore hill just above Kelvingrove Park It was designed by Sir Gilbert Scott and erected in 1871 The old univ was founded in 1451 (under a bull of Pope Nicholas V) by Bishop Turnbull on a different site from that occupied by the present buildings The modern univ presents a striking contrast to its predecessor It is built in imitation of the Early Eng style of architecture intermixed with Scots or domestic style of more recent times It is capped by a central tower 150 ft high

faculty of Arts wear scarlet gowns The usual univ degrees such as M A B Sc M D LLD DD etc are accorded A railway now stands upon the ground occupied by the old univ which was built in High Street and which became enriched in 1473 by four ac of land and extra buildings the gift of Sir James Hamilton of Cadzow It was decided it should be rebuilt in 1860 accordingly three estates were bought up both by the Gov authorities and by public subscription These estates were the Gilmorehill estate the Dumbarton Hill and the Claypans properties, the purchase was effected in 1864, and the foundation stone was laid in 1868 Over 1000 day students attend classes at the univ in arts engineering law medicine science and theology The Royal Technical College, which is affiliated to the univ, is the oldest foun-

dation of its kind in the world. It instructs annually 1000 day and 3000 evening students, and, in affiliated classes, 4500 evening students.

There are other important colleges and institutions in G., amongst which may be mentioned Queen Margaret College for women, the School of Art, the G. and W. of Scotland Commercial College, and the Scottish National Academy of Music. The corporation, through its education dept., provides education in its 285 day schools for about (1948) 165,000 young people (aged three to eighteen). Over 25,000 young men and women study technical and commercial subjects at the evening continuation classes. The Stow College has been organised to provide trade and technical instruction. Notable schools for boys are G. High School, a medieval foundation, and G. Academy (founded 1815). G.'s art galleries in Kelvingrove Park take the place of the McLellan Galleries, which with their pictures were acquired by G. in 1856. Kelvingrove Gallery was first opened as part of the 1901 International Exhibition, and officially opened as an art gallery and museum in 1902. The architectural design is founded on seventeenth-century classic Renaissance, but modified in part of a design reflecting the period of its erection. The building cost approximately £250,000. Of first importance among its contents is G.'s famous art collection. In its representation of European painting from the fifteenth century onwards the G. Art Gallery is superior to all other municipal collections, and several great additions have been made during the past decade. Associated with the art galleries, and housed in them, is a museum comprising sections devoted to archaeology, geology, natural hist., ethnology, and technology. In archaeology the section showing prehistoric relics is of direct local interest, and embodies a replica of a burial site found at Mt. Vernon on the E. boundary of the city. The natural hist. section, much damaged during the air raid of 1941, is being rebuilt on the most modern lines. The shipbuilding section, which also suffered considerable war damage, contains much to attract both expert and layman. Fortunately the Spencer collection of early ship models, as well as irreplaceable later models of historical interest, were saved. The Scott collection of arms and armour ranks high in comparison with similar collections throughout the Continent; fortunately this collection too escaped all damage in the air raids. A recent gift by Sir Wm. Burrell includes a collection of pictures, tapestries, porcelain, bronzes, etc., renowned throughout the world. Near the art galleries stands the Kelvin Hall, a 1927 addition to the buildings and institutions controlled by the municipal authorities. The site was formerly occupied by the old Bunhouse building which was burnt down in 1925. The hall is the ann. venue of the city's exhibitions, fairs, carnivals, etc.

The G. Corporation Libraries Dept. embraces twenty-nine estabs. The head-

quarters are at the Mitchell library, which has more than 500,000 vols. available for reference. Stirling's library and Elder Park library also have important reference collections. Other libraries include the Commercial library, Gorbals Dist. library (containing representative collections of books in twenty-five foreign languages), Elder Park and Townhead libraries, with special collections of books and periodicals for the use of blind readers.

The Scottish Orchestra in G., where Sir J. Barbirolli first won fame, has been known for nearly half a century. In drama G. is ahead of all other Scottish cities, the Citizens' Theatre being one of the chief creative dramatic centres. Also famous are the G. Unity Theatre, and the G. Orpheus Choir, whose conductor is Sir Hugh Robertson.

G. has maintained the reputation of the Clyde as the greatest shipbuilding riv. in the world. Innumerable ships of all classes have been built on the Clyde, including the world's largest and fastest liners *Queen Mary* and *Queen Elizabeth*; a £20,000,000 fleet for the Canadian Pacific Steamships Ltd., and the most powerful battleship ever built, H.M.S. *Vanguard*. G. engineers built the first airship to cross the Atlantic, and also the Forth bridge and London Tower bridge. While the heavier industries of shipbuilding and engineering have been predominant, the Clyde area has also developed many of the lighter forms of industry. Its textiles, carpets, threads, sewing machines, and food products are known all over the world. During recent years a number of new industries have been estab. in the Clyde area, including the manuf. of motor trailers; electric welding machinery; electrodes; electric lamps, batteries, and electric household appliances (vacuum cleaners, fires, and cookers); silk and artificial silk garments; seamless containers; safety-razor blades; and motor service equipment. Among the never products which are being manufactured by firms already estab. in the dist. are mechanical loaders and shovels, synthetic resin gears and insulated cloths, machines for bottle-making and labelling, gravel and sand washing, and the mechanical packing of food-stuffs, glass silk for heat insulation and sound deadening.

The Broomielaw is the name given to G. harbour, and being over 400 ft. wide, and at least 13 m. long, it is able to accommodate vessels of every description. The eighteen m. of riv. running from Albert bridge in the centre of G. harbour, highest point of the riv., now navigable by sea-going vessels, and Port G., are all administered by the Clyde Navigation Trustees, though G. harbour itself has a frontage of 4½ m. of this length. The riv. originally a fordable salmon riv., has been successfully straightened and deepened in such a manner that the scour of the tides keeps the channel clear of itself and comparatively little dredging is required. The rise and fall of the tide at G. bridge varies between 10 ft. 9 in., and 12 ft. 6 in. The R. Clyde is spanned by many bridges.

The Dalmarnock bridge was erected in 1891; the Rutherglen bridge was reconstructed in 1896. St. Andrew's suspension bridge spans the riv. from the Green to Hutcheson Tn., a dist. also approached by the Albert bridge. The Victoria bridge, built of granite, replaces the old bridge constructed by Bishop Rae in the middle of the fourteenth century. The most important of all the bridges, the G. or Broonielaw bridge, composed of granite, is a continuation of Jamaica Street; this was reconstructed in 1899, but it proved inadequate for the constantly increasing traffic, and the George V. bridge was opened a short distance downstream in 1927. In 1924 further dock accommodation was required and construction was begun on land acquired by the trust between Shieldhall and Renfrew. It is connected by rail and a road joining the new trunk road of the G. corporation scheme. In the year 1948, the last full year of normal working, 13,917 coastwise vessels of over 5,000,000 tons used the port of G., whilst 1510 foreign vessels, totalling 8,600,000 tons, entered the port. The tonnage of vessels using the port was 10,536,714. Over 3,697,000 tons of goods were imported, and almost 2,000,000 tons of goods were exported. There are 12½ m. of quays in G. harbour, including six tidal dock systems.

There are four large open spaces in G., one in each quarter of the city. The Green lies towards the E. and covers 140 ac., Queen's Park lies to the S. and comprises 100 ac., Kelvingrove Park is in the W. quarter and contains about 40 ac., whilst the Alexandra Park in the N.E. consists of 85 ac. In the S. also are the Bellahouston and Linn Parks. Altogether the G. corporation owns 88 public parks and 601 open spaces and children's playgrounds. The city also possesses fine botanic gardens, containing the Kibble Crystal Art Palace, a large glass structure for popular entertainments. Hampden Park, the ground of Queen's Park Football Club, can accommodate 150,000 spectators. In 1889 an Act was passed placing the entire city of G., with its surrounding dists., in the co. of Lanark. Two years later six suburban burghs and sev. suburban dists. were added, thus increasing the area of 6111 ac. to a total of 11,861 ac. The extreme length of G. in its entirety from N. to S. and from E. to W. is computed to cover 39,725 ac. G. is under the control of the lord provost, magistrates, and tn. council of the city. There are 114 popularly elected members of the tn. council and there are also two ex-officio members, the dean of guild —head of the Merchant's House—and the deacon-convenor —head of the Incorporated Trades. The tn. councillors elect from their own number the lord provost, twenty bailies, the river bailie and the river bailie depute. The work of the corporation has been a stupendous achievement, and all sorts of measures and schemes have been successfully carried through under its jurisdiction. All the water supplies, gas, and electricity, tramways, and municipal tenements, as also the meat,

cattle, fish, fruit, vegetable, and cheese markets are owned by the corporation. In 1914 Loch Katrine was raised 5 ft., and connected by tunnel with Loch Arklet, providing storage for 2,050,000,000 gallons of water. Additional works increased the city's water supply by 10,000,000 gallons per day. Gasworks were opened at Govan in 1921 and an electric generating station at Dalmarnock Bridge in 1920. The total length of tramway track is 268·82 m., covering 134·77 m. of streets and roads. Great reforms have been effected in the system of drainage. In 1897 the total area of G. was divided into three sections, each distinct, for the disposal of its own sewage. After the First World War unemployment and housing conditions were very bad and led to a strike, so that in 1925 a rent commission had to be appointed. With the increase in trade, in sanitary improvements, and in the extension of the city's boundaries, G. is only second in importance to the Brit. tn. and seaport, Liverpool. At Bellahouston Park, a great empire exhibition, covering 150 ac., was held in 1938. In the Second World War G. and the Clydeside sustained sev. severe enemy air raids, especially on March 13 and 14, 1941, when 1000 persons were killed, and much damage was done to business premises, dwelling houses, tenement buildings and flats, and industrial buildings, though the raiders conspicuously failed to destroy docks or shipyards. Probably the raiders deliberately aimed at homes, for in G. and Clydeside on those two nights, when incendiaries descended in masses, 40,000 houses were damaged, some of G.'s great tenement blocks being among the buildings most severely hit. G. returns fifteen members to Parliament. Pop. has grown enormously of late years, being (estimated 1947) 1,128,500. See G. Wyre-Todd, *The Story of Glasgow, 1911; History of Glasgow, 1931*; W. F. MacArthur, *History of Port Glasgow, 1932*; and A. Macgill, *Glasgow: its Rise and Progress, 1935*. 'Glasgow,' Brit. light cruiser (4800 tons). At the outbreak of the First World War this ship formed part of Adm. Cradock's squadron, which fought against the Ger. Adm. von Spee's squadron at the battle of Coronel (q.v.), Nov. 1, 1914. During the battle she was particularly engaged by two Ger. cruisers, *Leipzig* and *Dresden* and, though hit sev. times, escaped being sunk. She joined Adm. Sturdee's squadron, which avenged the Coronel defeat at the battle of the Falkland Is. (q.v.) on Dec. 8, 1914, and was one of the ships sent in pursuit of the Ger. in the early stages of the battle, and also later on. She was responsible for sinking the *Leipzig*.

Glasgow Academy was founded in 1845. Since 1920 it has been controlled by the Academicals War Memorial Trust. There is a preparatory school of some 270 boys, and an upper school of 300, mainly dayboys.

'Glasgow Herald,' one of the two most influential existing Scottish daily newspapers. It was founded in 1779 as a weekly paper called the *Glasgow Advertiser*

but three years later the name was changed to the *Glasgow Herald and Advertiser*. In 1805 it was again changed to the *G. H.*, its then editor or conductor and part-proprietor being Samuel Hunter, a qualified surgeon and a man of many parts, who devoted himself to the service of the paper for thirty-four years. In 1859 it became a daily penny paper. It opened later in Edinburgh, where it is now pub. simultaneously with the Glasgow issue, as a reply to the opening by the *Scotsman*, an Edinburgh paper, in Glasgow, and it is now connected by private wire by day and night with its London offices. It has long been distinguished by its daily light literary column. Many eminent Scottish writers have been either its editors or contributors to its columns. George Outram, the advocate and writer of *Lyrics, Legal and Miscellaneous*, succeeded Hunter as editor in 1837.

Glasgow School, group of painters living in Glasgow, Scotland, at the turn of the century, including amongst others Sir David Cameron and Sir John Lavery. See D. Martin, *The Glasgow School of Painting*, 1902.

Glasnevin, vil. in co. Dublin, Eire, 1½ m. N. of Dublin. There, famous Irishmen are buried in its cemetery. There are also botanical gardens and an agric. college. Pop. 3000.

Glaspell, Susan (b. 1882), Amer. novelist and dramatist, b. at Davenport, Iowa. Her play, *Allison's House* (1930), won the Pulitzer prize. Her novels include *The Glory of the Conquered* (1909); *Fidelity* (1915); *The Road to the Temple* (1926); and *The Morning is Near Us* (1940).

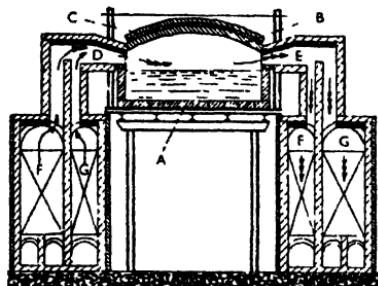
Glass, term which covers a wide range of substances which differ widely in chemical composition and physical properties, but which possess the essential characteristic of having cooled from a state of fusion to become solid without crystallisation. G., at room temp., can be regarded as a liquid which is of such a high viscosity that it behaves as a rigid elastic solid. Many G.s. when maintained at a suitably high temp. for sufficient time will devitrify, that is to say that some of the components crystallise out, the crystals causing opacity. Most commercial G.s. can be regarded as mixtures of silicates, but borate and phosphate glasses are made for special purposes. Window and plate G. are usually made by fusing silica (sand), sodium carbonate (soda ash), or sodium sulphate (salt cake), and calcium carbonate (limestone); magnesium carbonate is often added in combination with calcium carbonate as dolomite. Flint G. which is used widely for cut crystal glassware is made from sand, potassium carbonate (pearlash), potassium nitrate (salt petre), and red lead; and heat-resisting G. from sand, boric acid or borax, soda ash, and hydrated alumina. Many chemical substances are used as constituents of G.s. for optical purposes, where it is necessary to produce G.s. with precisely defined optical characteristics of refractive index and dispersion. Coloured G.s. are produced by the addition of metallic oxides to a colourless base G. Thus ferrous iron

gives bluish green, cupric oxide blue green, oxidised manganese violet-red shades, cuprous oxide and colloidal gold ruby colours, cobalt oxide blue. Opal G. is obtained by the addition of calcium and sodium fluorides or by tin and arsenic or calcium phosphate. Compounds of about thirty-five of the chemical elements are in use for glass-making at the present time. Great care is exercised in selecting the raw materials, since their purity and often their degree of subdivision will affect the quality of the ultimate product. The choice of sand is most important as all natural sands contain iron which imparts a green colour to the resultant G. The iron impurity must be as low as possible, but in certain types of glassware, the green colour can be neutralised by oxidising the iron to the ferric state, giving a yellow coloration, and then by superimposing a complementary colour. This process is known as decolorising and common decolorisers are manganese or selenium, both of which colour the glass pink.

History of Glass Manufacture.—The earliest specimens of glassware seem to have been made in Egypt, though the ancient Assyrians were also expert in glass-making. There is a whole series of Assyrian clay tablets (from the library of King Assurbanipal, seventh century B.C.), dealing with glass-making, in the Brit. Museum. It was, however, not until Graeco-Rom. times that any considerable development of the industry took place. The Romans greatly developed the industry, and were acquainted with the arts of G.-blowing and sheet-making. From the eleventh to the sixteenth century Venice was the home of the art of making beautiful vessels of glassware, and towards the end of this period there were produced objects of art which have never been excelled and, in the opinion of many, not even equalled. The manuf. of G. gradually spread over Europe, and from comparatively early time G. has been made in England. Venetian G. was made in London in the sixteenth century, and from that time onwards G. of all kinds has been made, but it was perhaps in the eighteenth century that Eng. work stood pre-eminent. That this was so was chiefly due to the fact that the Eng. flint G. was greatly superior in brilliancy to the Bohemian product and lent itself especially to the art of cutting. In America much fine G. was made by the Ger. emigrant Heinrich Wilhelm Siegel about the middle of the eighteenth century. Great progress has been made of recent years in the manuf. of many varieties of G. specially adapted for optical purposes.

Manufacture.—The melting of G. from the raw materials is carried out either in a tank furnace or in individual crucibles or pots in a pot furnace. Tank furnaces are used for large-scale commercial production largely by automatic processes where a continuous supply of G. is required for delivery to the fabricating machinery. Pot furnaces are used for the production of smaller quantities of G. for hand manuf. and melting is intermittent.

Tank Furnaces.—A tank furnace consists of a large bath, the bottom and side walls of which are built of refractory clay blocks previously fired to a high temp. (see fig. for cross-section of tank). The bath may be as large as 100 ft. by 35 ft. by 5 ft., but tanks of smaller size are in general use. The bath is covered by an arched roof or crown constructed of silica brick which will withstand the high temps. at which the G. is melted. The tank is



CROSS-SECTION OF REVERSIBLE REGENERATIVE GLASS TANK FURNACE

A, refractory tank blocks; B, furnace crown; C, crown insulation; D, inlet port for mixed gas and air; E, exit port for waste gases; F, air regenerators; G, gas regenerators. The direction of the gases is reversed periodically so that the incoming gases are preheated by the heat transferred to the regenerators by the outgoing waste gases.

usually heated by producer gas or fuel oil and air, but other fuels are used, e.g. natural gas, particularly in America. In the case of gas firing the gas and air inlets or ports are located round the sides of the tank above the G. level and prior to introduction into the furnace the gas and air are preheated by passing through the hot waste gas flues; both the regenerative and recuperative principles are used for this preheating and the fuel efficiency of the furnace is thereby increased. The end of the furnace at which the raw materials are introduced is known as the melting end, and the temp. increases from this point for some distance along the tank and then decreases towards the working end, the point at which the G. is removed for fabrication.

Pot Furnaces. A pot furnace is a large enclosure usually circular in shape and containing a number of pots arranged around the circumference. Access to the pots is arranged through working holes around the side of the furnace. The gas is introduced through an inlet at the centre of the furnace floor.

The Melting of the Glass.—The batch from which the G. is melted consists of a mixture of raw materials or 'frit' mixed with a proportion of broken G. or 'cullet.' The mixture is introduced either into the melting end of the tank or into the pot at temps. varying from 1300 to

1600° C., depending on the kind of G. Many reactions occur between the raw materials as they melt and large quantities of gas are evolved. The molten mixture reaches a stage at which it consists of a viscous mass full of bubbles which eventually rise to the surface and escape. The process of removing the bubbles is known as 'slagging.' In the case of the tank furnace there is a continuous change from the raw material at the melting end to the refined G. at the working end, the temps. at points along the tank being controlled so that the G. passes through the correct temp. cycle for the melting and fining processes. The production is thus a continuous one, with continuous filling at the melting end and continuous extraction from the working end. In the case of pot melting the cycle of operations from filling to working is controlled by varying the temp. of the furnace, and when refined the contents of the pot are removed for fabrication.

Methods of Fabrication.—There are four main methods of fabricating the G.: (1) by blowing, (2) by pressing, (3) by pouring, rolling, or drawing, (4) by allowing the G. to cool in the pot—a method peculiar to optical G. manuf. Although the first three methods were originally evolved by hand manipulation, and as such are still used at present, automatic methods have been developed for large-scale production.

1. Blown Glass. The process of blowing was invented by the Romans early in the Christian era and the methods employed to-day are still closely similar. The blowing pipe or 'iron,' which consists of a tube about 5 ft. long, is dipped into the molten G. which is 'gathered' by rotating the pipe. After removal from the furnace the rotation is continued so that the symmetrical form of the molten G. is maintained. The shape of the G. gathering can be modified by manipulation of the pipe either by spinning it about its own axis or by swinging it in its own plane, and by such methods the blower can work the G. into the approximate shape of the final article. The G. may now be transferred to a mould and blowing is continued until the article fills the mould. The G. is then broken away from the pipe and further processing is required to finish off the broken edge. This process is used largely for hollow vessels, but the manuf. of bottles and electric-light bulbs is carried out largely by automatic methods, the machines imitating the actions of the G. blower. However in the automatic blowing process a pre-forming operation is often carried out in which a hollow vessel is first formed by means of a plunger operating in a mould called the parison mould. The hollow vessel or parison thus forms the basis for the subsequent blowing operation in the final mould, the transfer from the parison mould to the final mould being carried out automatically. The production of crystal glassware is also carried out by blowing, except that considerable hand manipulation with a few simple tools is carried out to fashion the vessel while it is attached to the pipe. The flint G. used for this type of glass-

ware enables the manipulation to be carried out over a wide range of temp. Window G. was originally produced by blowing. In the Bohemian process sev. gatherings are necessary to give the mass of G. required, and the gathering is rotated in an open mould to form a neck for the subsequent blowing of a hollow cylinder. By alternate blowing and reheating of the gathering remote from the pipe, and by swinging in a pit, a cylinder about 5 ft. long is formed. The closed end of the cylinder is opened with shears and the cylinder is spun in a furnace until the end is uniform with the remainder of the cylinder. The cylinder is then detached from the pipe with a cold iron and the end from which the pipe was detached is removed to give a cylinder of uniform diameter. The cylinder is split longitudinally with a diamond and is opened out and subsequently flattened by re-heating and rubbing down on to a flat surface. In the older crown process a large sphere is blown from the gathering and an iron rod or "punt" is attached to the sphere diametrically opposite the pipe which is now detached leaving a circular hole. The open-ended sphere is now re-heated and spun until a circular disk is formed. The point at which the punt is detached from the disk yields the "bullion", which is a characteristic feature of windows glazed with G. made by the crown process. These processes of making sheet window G. have now been superseded by the rolling and drawing processes described below. G. tubing is made by a combined blowing and drawing method. The gathering is first shaped to form a short thick-walled cylinder and a punt is attached to the end of the cylinder away from the blowing pipe. Then as the blower blows into the cylinder the second man pulls the punt away, elongating the cylinder and thus decreasing the wall thickness. The rate of draw determines the diameter and wall thickness of the tubing. Again the method of hand manuf. has largely been copied for machine production, although various methods are employed for producing the initial thick-walled cylinder mechanically.

2. Pressed Glass. In the pressing process the G. is gathered on the gathering iron and is then dropped into a heated metal mould. A plunger is brought into the mould and the molten G. is squeezed between mould and plunger until it is rigid. The G. therefore takes up the shape of the mould and plunger. This method is capable of adaptation to mechanical methods. The G. leaves the furnace along a channel known as a feeder and flows through an orifice where the required mass is cut by shears and drops by gravity into the mould. A number of moulds are arranged around the circumference of a rotating horizontal table, and after one mould receives its G. it moves on to receive the plunger and at the same time the next mould moves into place to receive G. The pressing method is used largely for domestic hollow-ware, signalling lenses, motor headlamp lenses, and articles of a similar kind.

3. Pouring, Rolling, and Drawing. The processes of pouring, rolling, or drawing are used for producing G. in sheet form, and the bulk of the G. produced by such methods is used for window glazing. The earliest methods of making plate G. were by the method of pouring or casting. The contents of a pot were poured on to a flat table and were rolled into sheets varying in thickness from $\frac{1}{4}$ to 1 inch.



Chance Brothers Ltd.

CASTING AND ROLLING

The manufacture of coloured optical filter glass.

Guides moving in front of the roller determined the width of the sheet. Owing to the fact that the G. had been in contact with the table and roller, the surfaces were such that clear vision was obscured. The first improvement on this method was the Bicheroux process in which the G. is poured from the pot behind a pair of rollers from which it passes on to a moving table, the speed of the table being synchronised with that of the rollers. This produces a much smoother sheet than the original process. After cooling the sheet is transferred to a large circular table on which it is held by plaster of Paris. The table is rotated and two circular rotating disks are lowered into contact with the G. The G. surface is first ground by feeding coarse sand and water on to the surface, and this is followed by finer grades of sand until a finely ground surface is obtained. The process is repeated, using felt polishers and rouge to give a polished surface. The Bicheroux process is still employed for plate G. manuf., particularly where very large sheets or special thicknesses are required. However, for mass production of polished plat G., a continuous rolling process, using tank-melted G., is used. The molten G. emerges from the working end of the tank over a weir and passes through a pair of water-cooled rollers from which it cools and passes through the annealing

lehrs. Sheets are cut to size from the continuously moving ribbon and these are transferred to tables for grinding and polishing. The grinding and polishing process is also continuous, the G. passing through a series of grinders each of which uses a slightly less coarse abrasive. The continuous process of rolling is also used for the production of figured and wired G. For the production of figured G., that is G. with a regular pattern impressed upon it, the rollers are machined to the appropriate pattern and the G. takes up that pattern as it passes through them. Wire-netting is often introduced at the point before the G. passes through the rollers and such G. is used largely for glazing factory roofs where some reinforcement is necessary to hold the G. together in case of cracking. For the production of clear sheet window G. it is necessary that the sheet should be formed with a smooth, clear surface, and it is therefore essential that it should not come into contact with either metal rollers or a metal table. The process usually employed in this case is known as the Foucault process. The molten G. issues from a slot in a fireclay float or debiteuse which is depressed into the G. surface in the making end of the tank. Molten G. wells up through the slot and the stream is drawn away as a sheet by means of a series of rollers above the debiteuse in a vertical tower. These rollers only come into contact with the surface of the sheet after the G. is rigid and do not therefore distort the G. surface.

4. *Optical Glass.* Optical G. requires the most particular attention, because it is essential that it should be homogeneous and should not absorb light. It is therefore necessary to use the finest raw materials, and the essential quality of homogeneity is attained by stirring the G. in the molten state after melting and refining has been completed. After stirring the pot is removed from the furnace and is transferred to another furnace for slow cooling. When cold the crucible is removed, broken, and the fragments removed from the G. or broken into smaller lumps. The product is carefully examined for flaws, and any pieces with marked defects are rejected. The accepted G. is once more heated to the softening point, moulded into the required shapes, and then subjected to a prolonged process of cooling. Further close examination reveals a large percentage of defective pieces, so that it is not surprising that the price of good optical G. is high. Optical G.s. are required to fulfil in greater or less degree the following demands. They must be homogeneous, transparent, free from colour, and internal strain, stable to atmospheric influences, of a certain degree of hardness to resist scratching, and possess specified refractive and dispersive power.

Annealing of Glass.—Annealing of G. is necessary after fabrication in order to avoid stresses which will occur if the G. is cooled too quickly. The stresses arise from the fact that during cooling temp. differences must exist across any piece of

G. and therefore the G. will contract to different degrees at different points. So long as the G. is in a plastic condition it can adjust itself to these differences, but once any part of it has become rigid permanent stresses will appear when the G. has reached a uniform temp. There is always a tendency for the stresses to be relieved and if sufficiently high the stress release will occur by breakage. High stresses are often put into G. by controlled heat treatment, the outer surface of the G. being heated to redness and then being cooled rapidly either by air blast or by immersion in oil. This treatment has the effect of imposing high compressive stresses on the surface and, as G. usually fails under tension, has the effect of increasing the strength of the G. Such G. is known as toughened G., and if breakage occurs it fractures into tiny fragments which avoid risk of injury.

Safety Glass.—In addition to the reinforced wired G. mentioned earlier, safety G. consisting of alternate laminations of G. and transparent cellulose or cellulose derivative is made under the name of Triplex G. In manuf. the composite sheets are cemented together and are subjected to high pressure in a hydraulic press.

Coloured Glasses.—Coloured G.s. are made for various purposes. Coloured decorative glassware has been made from the earliest times, but nowadays many coloured G.s. are made for the specific purpose of confining the light they transmit to definite regions of the spectrum, being opaque to other regions. Thus ultra violet transmitting and infra red transmitting G.s. are available which absorb practically the whole of the visible spectrum. A wide range of G.s. is available which transmit only certain portions of the visible spectrum and these G.s. have wide applications in photography and in physical and chemical apparatus. A filter G. has been developed during the last few years which absorbs infra red rays while transmitting a high proportion of the visible spectrum. Such a G. is very valuable in projection apparatus, where it is necessary to prevent heat from the projection lamp reaching the lantern slide or film while the visible light remains unchanged in intensity and colour.

Fibreglass.—In recent years considerable progress has been made in drawing G. into fine fibres and subsequently spinning the fibres into threads which can be woven into cloth. This material has excellent electrical, heat, and sound insulating properties and has a wide variety of uses. Owing to the fact that it is stable up to the softening point of the G., it can be used at temps. at which other insulating materials fail. In addition to cloth, tape, and sleeveing for wire, this material is available in various forms for placing round steam pipes and also for placing between walls for heat and sound insulation.

Glass-crab, name given to *Phyllosoma*, the young form of *Palinurus*, a genus of edible crustaceans found in the Mediterranean.

Glasse, Hannah, Eng. writer on cookery of the eighteenth century. She was a

London habit-maker, and a Rom. Catholic. She became bankrupt in 1754, and d. before 1770. Her most famous work was *The Art of Cookery* (1747), and she also wrote *The Compleat Confectioner* (about 1769) and *The Servant's Directory* (1770). She did not write 'First catch your hare,' but did write 'Take your hare when it is cased' (i.e. skinned).

Glass Eye, see under HORSE (DISEASES).

Glassites, Scottish religious sect, founded by John Glas or Glassie (1695–1773) (q.v.). He was a Scottish divine, b. at Auchtermuchty, Fifeshire, who, in 1719, obtained the charge of Tealing in Forfarshire. Owing to the views which he promulgated here he was removed from the ministry in 1730, but in 1739 he was restored by the General Assembly to the position of 'a minister of Jesus Christ' being still forbidden to assume the title of 'minister of the Kirk of Scotland.' The sect which he formed, also known as the Sandemanians, from Robert Sandeman (1718–71), a disciple of Glas, practised community of property, abstinence from certain kinds of flesh food, the weekly celebration of communion, and the holding of 'love feasts.' It detached itself from the Presbyterian body to join the Independents.

Glass-snake, name applied to all individuals of the genus *Ophisaurus*, family Anguidae; they are serpent-like lizards about 3 ft. long, with rudimentary limbs and an elongated, brittle tail. *O. septentrionalis* is common in N. America, and in many ways resembles the Brit. slow-worm; it lives on snails, worms, insects, etc., and spends much of its time underground. *O. gracilis* inhabits the E. Himalayas and Burma. *Pseudopus*, an allied genus, is found in S. Europe.

Glass, Stained, see STAINED GLASS.

Glasswort, the popular name for *Salicornia herbacea*, a species of leafless herbs belonging to the family Chenopodiaceae. Also called marsh-salsify, crab-grass, etc. It grows on the seashore and in salt marshes. It is widespread in S. Europe and N. Africa. There are two Brit. species, *S. herbacea* (crab-grass) and *S. radicans*. Soda can be obtained from G. by burning, and was, formerly, often obtained in this way for the manuf. of glass and soap.

Glastonbury. This tn. was once an ls., but now forms a peninsula, as it is surrounded on three sides by the R. Brue. It was originally called the ls. of Avalon or Apples, and is one of the most picturesque spots in Somersetshire. It has many interesting historical features. G. is famed for its abbey, which dates back to the year 708, when it was built by the Saxon, Ina, in place of the Brit. monastery founded about 601. The abbey is a ruin, and includes different periods of architecture. The ruins of the church, St. Joseph's Chapel, and the Abbot's Kitchen, are the only surviving buildings. St. Joseph's Chapel is the finest portion of the ruins and points to the Transition period of the twelfth century. It is remarkable for its crypt, which was not inserted beneath it until the fifteenth century. There is a legend that Joseph of Arimathea came

over to G. and founded a church there; moreover, he is stated to have planted a graft from the Sacred Thorn there. G. Tor is a hill upon which the last abbot of G. suffered capital punishment for 'divers and sundry treasons,' 1538: it is the property of the National Trust. A lake-vill. was discovered in G. in 1892, pointing to the existence of Celtic tribes. Other features of interest are the market cross and St. George's Inn. Pop. 4600. See A. G. Chant, *The Legend of Glastonbury*. 1949.

Glatz (Polish Kłodzko), fort. tn. in Silesia, Poland (formerly of Prussia), on R. Neisse, near the Bohemian border, and 58 m. S.W. of Breslau. Before the Second World War it was strongly defended by two citadels, one on an eminence of 200 ft., and has had an adventurous hist. It is noted for manufs. of hardware, machinery, furniture, and spirits. The tn. fell to Konev's Russian forces in 1945. Pop. 19,200.

Glauber, Johann Rudolf (1601–68), German chemist, b. in Karlsstadt, Franconia. He is chiefly famous for his discovery of G.'s salt (q.v.), which he prepared, in 1658, and identified with a natural mineral salt found in waters throughout Europe, and having a medicinal value. He also produced hydrochloric acid from oil of vitriol and salt. He was an alchemist and a voluminous writer. His *Opera Omnia* (Amsterdam), 1661, were trans. into Eng. in 1689.

Glauber's Salt, or Sodium Sulphate ($\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$), is prepared by heating salt with sulphuric acid and crystallising the residue from water, from which it separates as colourless prisms having ten molecules of water of crystallisation, which are lost on prolonged exposure to the air. G. S. has a cooling, bitter, and saltish taste, is a mild laxative and diuretic, and is present in the waters of Karlsbad, Cheltenham, etc.

Glauchau, tn. of Germany, in Saxony, situated in the circle G., on the Zwickauer Mulde, 8 m. N.E. of Zwickau, and 36 m. S.S.E. of Leipzig. Before the Second World War it was a busy industrial centre; the chief manufs. were cloth and woolen goods, paper, beer, etc. There were also calico-printing factories, dye works, saw and flour mills, iron works, etc. In the Second World War, the tn. fell to the Allies in the closing days of the war. Pop. 28,000.

Glaucoma (Gk. γλαύκος, bluish green), disease of the eyeball characterised by an increase of pressure of the fluids within it. This pressure or tension causes the crystalline lens to assume a greenish-grey or bluish-green hue. The condition is in part mechanical, in part congestive, and results from the iris's outer margin being pushed against the cornea. G. occurs mostly, at or after middle life, leading to increasing loss of sight, unless remedied in time by an operation upon the iris or sclerotic. It may, however, be necessary to remove the damaged eye, in order to preserve the vision of the unaffected one.

Glauconite, hydrated silicate of iron and potassium found in the muds deposited

at the bottom of the sea. The various colours of these deposits are probably due to the presence of G., which is itself green. G. occurs in masses of minute crystals; these masses are often rounded, and it is believed that they represent casts of the shells of Foraminifera which after dissolution of the shell are liberated. It is possible that such casts have been broken down into fine particles which are transported by currents and so distributed amongst the different deposits. G. is found rarely in the oldest rocks, but more plentifully in the Secondary and Tertiary formations.

Glaucus, name given to a genus of nudibranchiate gastropods found in the Atlantic and Pacific Oceans; they have long, slender, slug-like bodies, with three pairs of lateral out-growths, and the heads are furnished with tentacles. They are of a greenish-blue colour, whence their name.

Glaucus. In Gk. mythology: 1. Builder and steersman of the *Argo*, who escaped unwounded from Jason's fight with the Tyrrhenians, but sank to the bottom of the sea and became an ocean divinity, often surnamed Pontius. 2. Chariteer, the son of Sisyphus, king of Corinth, and Merope, daughter of Atlas, often surnamed Potneus. He wished to enrage Aphrodite by the exceeding swiftness of his mares, and the goddess inspired them with such fury that they tore him to pieces. 3. Lycian prince, son of Hippolochus and grandson of Bellerophon, who was an ally of Priam against the Gks. in the Trojan war. He had a famous conversation with Diomed, and exchanged his own golden armour for Diomed's iron suit. He was killed by Ajax. 4. Son of Minos II. and Pasiphae, who was smothered in a tub of honey, but restored to life by Polydorus, the soothsayer.

Glazebrook, Sir Richard Tetley (1854-1935), physicist. Educated Liverpool College; Trinity College, Cambridge (scholar) - 5th wrangler 1876; Fellow 1877. Principal, Univ. College, Liverpool, 1898-99. Director, National Physical Laboratory, 1899-1919. Prof. of aviation and director of dept. of aeronautics, Imperial College of Technology, 1920-23. Chairman of the Advisory Committee for Aeronautics from its formation in 1909, and also, until 1933, of the Aeronautical Research Committee which succeeded it in 1920. Albert medallist, Royal Society of Arts. With Dr. (later Sir) Napier Shaw, he took a leading part while at the Cavendish Laboratory in organising the teaching of practical physics. He also did valuable work on questions relating to the determination of the fundamental electrical units. Wrote *Science and Industry* (1917), Editor of the *Dictionary of Applied Physics* (1922-23).

Glazing is the art of fixing glass into supporting frames, e.g. windows, doors, roofs. The glazier of the less specialised type may cut the glass himself, but more frequently G. and glass-cutting are two entirely separate crafts. The actual fixing agent employed is putty. This is a mixture of whiting (calcium carbonate, CaCO_3) and 'boiled' linseed oil (i.e. linseed

oil previously heated to about 150° C . with litharge, lead acetate, or some similar drier). On exposure to the air the putty hardens and thus keeps the glass in position. In G., the putty is usually spread by hand, the glass placed in position and held by nails, and the putty then trimmed with a putty knife. Putty is not generally used for indoor G., appropriate wooden bradings serving the purpose both efficiently and more elegantly. Frames or sashes for holding the glass are made of wood or metal; of the latter material lead is used for small lights, chiefly for decorative purposes. The small pieces of glass are placed in the lead framework, and the edges of the lead are then pressed over. Much so-called leaded glass consists of large panes on to which a sham framework of lead has been cemented. Various kinds of glass are used for particular types of G.; thus for glass roofs and skylights wired glass, i.e. glass with wire-netting in it, is commonly employed, while safety glass (q.v. under GLASS) finds wide application in motor vehicles, etc.

Glazunov, Alexander Constantinovich (1865-1935), Russian composer b. at St. Petersburg. After being taught music at home as a child he studied with Rimsky-Korsakov. He composed his first symphony before he was eighteen, and its success decided his future career. He went to Germany, where he became acquainted with Liszt, and under his advice he devoted himself to composition. In 1889 his second symphony and his symphonic poem *Stenka Razin* appeared. These were followed by numerous compositions, including symphonies, overtures, marches, chamber music, songs, etc., and music for the ballets *Raymonda*, *Les Saisons*, and *Ruse à amour*. He was appointed director of the St. Petersburg Conservatoire in 1905, but wrote little after that to augment his earlier output. He left Russia in 1928, and settled in Paris.

Glebe Land: 1. In eccles. law is the land which belongs to a church as its dowry. Every church is entitled of common right to house and glebe, and formerly no church could be regularly consecrated without such house and land. Where an incumbent before his death has manured and sown G. L. at his own cost with corn or any other grain, he is entitled to dispose, by his will, of all the profits accruing from the crops sown by him. Where the total income of the incumbent of a united benefice appears to be more than sufficient for his due maintenance, the whole or some specified part of the G. L. may be given as a perpetual endowment for the support of any adjoining poor benefice. G. L. generally speaking is exempt from the consistently with the canon law maxim, that the church shall not pay tithes to the church. The exemption does not, however, extend to the lessee of the vicar. Sales of G. L. may be effected by incumbents under the Glebe Lands Act, 1888, with the approval of the Ministry of Agriculture. 2. In the civil law (q.v.) G. L. denotes the soil of an inheritance, and the rents of the glebe were said to be *gleba*

adscript or attached to the soil. See Sir R. J. Phillimore, *Ecclesiastical Law of England* (2nd ed.), 1895, and L. A. Good-
eve, *Real Property*.

Glee, in music, a vocal composition in at least three parts, each taken by only one voice, and consisting of two or more contrasted movements. The subject may be of any type, and a g. is sung unaccompanied, usually by male voices. It is distinguished from a madrigal by having no contrapuntal harmony, and from a partsong by the independence of its parts. It is entirely Eng. in origin and cultivation, and its best period was during 1760–1830, the most famous composers of gs. being Dr. Arne, Samuel Webb, Richard Stevens, and John Wall Callcott.

Gleig, George Robert (1796–1888), Scottish author, b. at Stirling. Entered the army, and served in the Peninsular war (1813), and in America (1814). In 1820 he took orders; became chaplain of Chelsea Hospital, 1831; chaplain-general of the forces, 1841; and inspector-general of military schools, 1846. He was a most voluminous writer and his works include *The Subaltern*, 1826, his best-known novel, founded on incidents in the Peninsular war; *The Campaign of New Orleans* (1821); *Chester Pensioners* (1829); *History of India* (1830–35); *Lives of Military Commanders* (1831); *The Hussar* (1837); *The Story of the Peninsular War* (1839); and *Lives of Warren Hastings* (1841); Clivo (1848); and Wellington (1862). See W. Maquin, *A Gallery of Illustrious Literary Characters*, 1873.

Gleim, Johann Wilhelm Ludwig (1719–1803), Ger. poet, b. at Ermsteben, near Halberstadt. He gave great encouragement and assistance to the young and ambitious poets of his day, and on this account earned for himself the name of 'Father G.' His efforts, however, in this direction were not of a sufficiently judicious and discriminating nature. He wrote a good deal of moderate poetry, his patriotic *Preussische Kriegsblader von einem Grenadier* (1758) displaying considerable force of expression and genuine sentiment. His other works consist chiefly of odes and, in the style of Horace and Anacreon, songs and rhymed tables, etc. His collected works were pub. in 8 vols. (1811 ff.). See lives by W. Körte, and R. Weinmann, 1920.

Gleiwitz (Polish *Gliwice*), tn. of Poland, in the former Prussian prov. of Silesia (Upper), situated 24 m. N.E. of Ratibor, on the railway between Oppeln and Cracow. It is the centre of the mining industry of Upper Silesia, and is noted for the manuf. of woollens; it has glass works, and an iron foundry, and meal mills. It fell to Marshal Konev's forces in the early part of 1945. Pop. (1939) 112,000.

Glen, William (1789–1826), Scottish poet, b. in Glasgow. He was the son of a merchant, and first took to trade and farming, but he soon gave these up and pub. a book of poems in 1815. He is remembered for his popular song, *Wae's me for Prince Charlie*.

Glenalmond, Perthshire, Scotland. The name given to the valley of the R. Al-

mond, the finest part being called Sma' Glen. It is one of the most picturesque valleys of Scotland. An important Episcopalian institution is situated here, about 10 m. N. of Perth, called Trinity College, founded in 1841 with the idea of raising a Scottish Episcopalian public school on the model of the great Eng. ones. Gladstone was the main initiator of the project.

'**Glenart Castle**', Brit. hospital ship which was torpedoed and sunk on Feb. 26, 1918, by a Ger. submarine in the Bristol Channel regardless of the fact that the boat was showing the Red Cross and, in all respects, conforming to the requirements of 'The Hague Convention as to hospital ships. Only 38 persons out of 200 were saved.

Glencairn, Earls of. This title was first borne by Alexander Cunningham of Kilmaurs, Ayrshire, who was created earl (1488), and d. shortly afterwards. It is taken from a par. of Dumfriesshire, Scotland. Among the more famous earls were: William, fourth earl (d. 1547), who supported Henry VIII.'s Scottish policy and opposed the duke of Albany. He joined Angus and Lennox (1524) to place their young king under control of a council of regency. He was defeated (1541) at Glasgow Muir by Arran. See Sadler, *State Papers*, and Douglas, *Scotch Peerage*, i. 633–36.

Alexander, fifth earl (d. 1571), third son of preceding, supported Knox and the reformation in Scotland, and composed a satirical poem against the Grey Friars, had persecuted G. Buchanan.

William, ninth earl (c. 1610–64), organized the Highland rising of 1653, but was defeated at Dunkeld, 1654. He warmly supported Charles II., becoming lord chancellor of Scotland on the Restoration.

James, fourteenth earl (1719–91), was a friend of Burns. The title became extinct with **John**, fifteenth earl, 1796.

Glencoe: 1. Wild, gloomy valley of Argyllshire, Scotland, near the head of Loch Levan, extending from Ballachulish E. for 10 m. The mts. rise perpendicular on either side (3000–3800 ft.). The bed is swept by Ossian's 'dark torrent of Coma' (R. Coe), which enters Loch Leven. The pass is noted for the treacherous massacre of the Macdonalds in Feb., 1692, brought about by Dalrymple and Capt. Campbell. See Lord Macaulay, *History of England* 1849–61. 2. Hamlet of N. Natal, S. Africa, on the railway from Ladysmith to Dundee.

Glen Cove, tn. of New York, U.S.A., in Nassau co., on the Hempstead and G. branch of the Long Is. Railway. There are flour mills and a starch factory. Pop. 11,430.

Glendalough, mt. glen of Ireland, situated 10 m. N.W. by W. of Wicklow, and 8 m. from Rathdrum station. It is watered by the stream Gleneale, a trib. of the Avonmore, and is famous for its picturesque beauty. The ruins of an ancient city, which, from the sixth century to 1214, was a bishop's see, are situated here; chief among them are the 'Seven Churches,' one of which was the sanct.

cathedral. Most of the churches were founded by St. Kevin.

Glendower, Owen (Owain ab Gruffydd) (c. 1359-1416), famous Welsh chieftain claiming descent from Llewelyn and the ruling princes of Wales, an opponent of the Eng. in Henry IV.'s reign. He had been patronised by Richard II., but was at first a follower of Henry IV. until local troubles made him rebel. He laid claim to the crown of Wales (1402), and refusing a definite engagement, checked two Eng. expeditions by wearing out the king's forces among his mt. fastnesses. G. defeated the Eng. near Knighton, 1402. On the third Eng. march to Wales, he retired to the mts. With Mortimer and Hotspur he formed a conspiracy against Henry, but was defeated at Shrewsbury (1403). He also allied with Scotland, Ireland, and Charles VI. of France. In 1405 he was defeated by Henry, Prince of Wales, but remained hostile to the end of his days. He was the last champion of Welsh independence against the Eng. kings. See T. Thomas, *Memories of Glendower*, 1822; J. H. Wyllie, *History of England under Henry IV.*, 1881-91; A. C. Bradley, *Owen Glyndwr*, 1904; and Sir H. Ellis, *Original Letters Illustrative of English History*, 1925-16. See also Shakespeare's *Henry IV.*; the *Retrospective Review*, xiii., 1826, the works of Iola Goch and Lewis Glyn Cothi, and the bibliography compiled by D. R. Phillipps, 1915.

Glenaeagles, picture-que glen in S. Perthshire, Scotland, about a mile S. of Crieff, through which flows the Ruthven. Agricola is supposed to have passed through it when marching on Ardoch. It has excellent golf links.

Glenelg, tn. and watering-place of S. Australia, situated in Adelaide co. on the W. coast of Holdfast Bay, and 5 m. S.W. of Adelaide. Here in 1836 S. Australia was formally proclaimed to be a Brit. colony. It is connected with Adelaide by two lines of railway. Pop. 4000.

Glenfinnan, hamlet and glen in Inverness-shire, Scotland, on Loch Shiel, 18 m. W. of Fort William. A tower marks the place where the Young Pretender raised his standard in 1745.

Glenhariff, vill. of Co. Cork, Eire, 8 m. N.W. of Bantry. It is a favoured beauty spot, standing at the head of a harbour of the same name, an island-studded arm of Bantry Bay.

Glenarry, valley of the Curry, in Inverness-shire, Scotland. A picturesquely wooded vale, it was the property of the Macdonells and gives its name to the Highland bonnet or cap.

Glenlivet, valley of Banffshire, Scotland through which runs the Livet. It is some 20 m. S.W. of Huntly and is noted for its whisky.

Glenmore, or the Great Glen, valley of Scotland which stretches for more than 60 m. across the central part of the country, from the N.E. at Inverness to the S.W. at Fort William. The Caledonian Canal, which was constructed by connecting the lochs Ness, Oich, and Lochie, flows through the glen.

Glenroy, narrow glen, 14 m. long in the Lochaber dist. of Inverness-shire, Scotland. The Roy flows through the valley which is remarkable for having in each side three regular and distinctly formed terraces, the margins of a former loch.

Glens Falls, city of New York state, U.S.A., in Warren co., 55 m. N. of Troy, situated on the Hudson R. and connected with Champlain Canal. It has a descent of about 50 ft. between cliffs of black marble. There are valuable quarries and Portland cement works. The tn. possesses a Crandall free library, state armoury, hospital, etc. It is an old Quaker settlement of about 1763. During the Revolution of 1780 it was burned to the ground, but was rebuilt. Pop. 20,000.

Glentilt, glen in N. Perthshire, Scotland, watered by the Tilt. It extends from Blair Atholl for a distance of 13 m. At its upper part it is hemmed in by high mts., and numerous torrents flow down their slopes through the glen. The rock formation here is geologically interesting; white, grey, and green marble have been quarried.

Gliding, art of flying in an aeroplane, without the use of engines of power, by taking advantage of the natural currents of air and the law of gravitation. The first principle involved in this kind of flight is that by the skilful arrangement of planes on a flying machine its fall can be retarded in such a way as to make the fall itself a means of propelling the aeroplane over a long distance. The plane, with power behind it, can also take advantage of the law of gravitation in this manner. But whereas the power machine can elevate the front of its planes and, by driving against the wind, climb to a desired height, the machine without power must find other means. Here, use is made of the second principle, which is based on the fact that the air currents in passing over uneven or hilly ground follow the contour of the land over which they pass, and though, in relation to these currents, an aeroplane may be falling all the time, the breeze that blows up the side of a long and fairly steep hill actually lifts to a greater height any plane floating with it. Skilful manipulation of the plane enables the glider to take advantage of these two principles to cover long distances. By alternately 'soaring,' or making use of the lift of those upward currents and 'gliding,' or using the pull of gravitation as a means to cover distance, the airmen can now remain in the air for an almost indefinite period. The art of G. was an important part of the development of flying, and continues to afford useful information.

Long before the progress of the motor car turned the attention of inventors and engineers to the possible uses of very powerful engines in very small compass, experiments were being made in heavier-than-air flying machines, which, starting from high ground, should fly a long distance before landing. Among the most successful pioneers in this form of experiment were the two brothers Lilienthal, Chanute and Montgomery, whose experiments gradually led to the adoption of the

flying machine, which has become more or less standardised. Gliders, or motorless aircraft, towed by other aircraft, and used to carry 'airborne' troops and stores, were much developed in the Second World War. The Brit. 8-ton Hamilcar glider (designed in 1941) which was used with great success by the Army Air Corps in the invasion of Europe in 1944, was then the largest wooden aircraft in the world. It had a wing-span of 110 ft. The fuselage formed a cabin which was nearly 26 ft. long, 8 ft. wide and 7 ft. high. It could transport a Tetrach Mk. IV. tank with crew, a T19 Locust tank, a 17-pounder anti-tank gun, a tractor and angle-dozer (used in aerodrome construction), main portions of a bulldozer, 2 armoured Scout cars, a self-propelled Bofors-gun, and a variety of other loads. It required a four-engined bomber to serve as its tug, Handley-Page Halifax being used for the purpose. When fully loaded this transport glider weighed 36,000 lb., or 16 tons, and the glider-tug combination could cruise at 150 m.p.h. The Germans used the 'Gotha' GO 242 glider in the N. African campaign, but in size this transport craft was completely dwarfed by the Hamilcar. The Germans produced, but did not bring into service, a glider for photographic reconnaissance, launched from a Dornier bomber at about 30,000 ft. A rocket motor then took it to 75,000 ft. until its fuel failed, when it became a glider and accomplished its mission thereafter in a glide. The pilot could jettison the nose part with himself inside, and descend by parachute.

G. became very popular in Germany after the First World War. It also took root in England, where many amateur G. clubs were formed. A Brit. G. Association was also estab., which is now affiliated to the Royal Aero Club. Notable G. records are those of Fl./Lt. R. C. S. Forbes (194 m. in 6 hrs. 7 min.) and F. O. G. Archibald (194 m. in 5 hrs. 12 min.) at Fussburg, Germany (Brit. zone of occupation) in 1948, and Philip Wills, Hatfield to Truro, May 1, 1949. See T. Horsley, *Soaring Flight*, 1945, and A. C. Douglas, *Gliding and Advanced Soaring*, 1947. See also HORSE GLIDER.

Glinka, Mikhail Ivanovich (1804-57), Russian composer; b. at Novospaskoi, of noble family. Chief operas, *A Life for the Tsar* (1836) and *Russian and Ludmilla* (1842). The latter work is based on Pushkin's poem. In these works G. liberated Russian music from its overzealous imitation of W. opera and thereby laid the foundations of a really national opera.

Gliwice, see GLIWITZ.

Globe, tn. of Arizona, U.S.A., situated in Gila co., of which it is the cap., and 30 m. N. of Tucson. It is the centre of a copper mining dist., and stands third in the U.S.A. for production. Gold, silver, asbestos, quicksilver, and coal are also found. Pop. 7000.

Globe-fish, marine fish of the diodontidae and totodontidae families. They are so named because of their power of distending the gullet with air, and thus

assuming an almost globular form. Most of the species are found in tropical and sub-tropical seas, where they feed on corals, molluscs, and crustaceans, for which their hard, beak-like snouts are peculiarly adapted. Some of them are highly poisonous, and most of them are armed with spines of differing shape and size; they vary in size from a few inches to two feet, and are nearly always brilliantly coloured. *Tetronotus* and *Diodon* are the best-known genera. *D. hystrix*, the sea hedgehog, being the largest of all the species.

Globe Flower or Golden Ball, popular names of the genus *Trollius*, perennial erect plants of the order Ranunculaceae. The best-known Brit. species is *T. europaeus*, which has pale yellow globular flowers.

Globes, spherical maps representing the appearance of the heavens or the earth. A terrestrial globe naturally conveys a far more accurate impression of the relative areas of land and water and of the true position of any one place with regard to another than can possibly be given by a flat projection, where angles and distances are of necessity distorted. A globe reproduces in miniature the spherical shape of the earth, only that no account is taken of the flattening at the poles. It is constructed as follows: Layers of paper are pasted on to a wooden or iron matrix. At the poles are metal meridian circles through which pass the ends of the central axis round which the globe is made to revolve. The meridians and parallels are drawn on a composition of whiting, glue, and oil with which the sphere has been coated. Great care is needed to attach the gores or segments (from twelve to twenty-four in number) on which the map is already printed, to the globe. Formerly the preparation of a globe was a laborious process, as it was painted by hand or else engraved on copper. For schools and libraries a globe is made to revolve round its own axis in a somewhat larger metal meridian, which in its turn is fitted into a horizontal wooden ring fastened to a stand. The gores, it should be added, are now prepared on strictly mathematical principles. A normal globe has a diameter of 12 or 18 in. At the Paris Exhibition of 1889 an interesting globe was on view, which was an exact model of the earth, only a million times smaller. Thus the equator measured 40 metres, which represented 40,000 kilometres, the actual circumference of a great circle. Such a sphere would make the calculation of distances an easy matter. Sometimes a globe is embossed to show the highlands and lowlands. Compound G. are also made, the celestial globe being of glass and enclosing the terrestrial. Accessories such as a flexible quadrant to measure distance between any two places, a compass usually put below the sphere, and an hour-circle round the N. pole, are indispensable if the globe is to be used for solving geographical and astronomical problems. On the celestial sphere the stars are drawn as it is calculated they would appear if looked at from the centre

of that sphere, the relative positions and distances of the stellar bodies being exactly the same as they appear in the actual heavens.

Celestial G. seem to have been made first. Thus they were understood in the days of the Venerable Bede, and some were contrived by Gerbert of Aurillac (929). The oldest of the Arabian celestial spheres is now in the Florence museum; and another, dated about 1225, can still be seen at Velletri. A certain scientist of China, Ho-shing-tien, devised such a sphere as early as 450, whilst to turn to Gk. civilisation the celestial sphere of Hipparchus (c. 150 n.c.) was still on view in the great library of Alexandria in Ptolemy's day. In the Naples Museum is one which is believed to be as old as the fourth century B.C. The Laon and Nuremberg terrestrial G. are contemporary with Columbus, who was certainly familiar with similar maps (c. 1492), and there exist reliable illustrations of the terrestrial sphere of Crates of Mallus (d. 145 n.c.), dividing the earth, by an equatorial and a meridional ocean into four quarters, thus anticipating the discovery of the Americas and Australia.

‘Globe, The’ (or more fully, ‘The Globe and Traveller’), started in 1803 as a six-penny paper by a syndicate of publishers primarily with the object of securing to themselves an advertising medium. Its first editor was George Lane, and other prominent members of its staff or contributors from time to time were James Bacon (subsequently Vice-Chancellor Sir James Bacon); R. H. Barham, author of *Ingoldsby Legends*; Thomas Love Peacock, satiric novelist, poet, and official of the E. India Company; and Frédéric Bastiat, the Fr. economist. In 1842 it took over its old rival the *Courier*. Later, at the ebb of its fortunes, it was changed into a Conservative paper, its new proprietors, including Sir Stafford Northcote, lowering the price to one penny. Afterwards it became the property of one of its editors, Capt. (subsequently Sir George) Armstrong. In 1907 it was sold to Sir Hildebrand Harmsworth. After a somewhat lively career, the paper came to an end soon after the First World War.

Globe Theatre. In the year 1868 this theatre was opened in London, the first production being one of H. J. Byron's pieces, entitled *Cyril's Success*. There was also a theatre of the same name which stood on Bank-side and was famous in Elizabethan times where the works of Shakespeare and his contemporaries were represented. Every kind of dramatic entertainment was produced at the G. T. of 1868, from tragedy to farce. Pinero wrote a comedietta, produced there in 1877, and in the following year were seen J. L. Toole's *Trying a Magistrate*, and another play by H. J. Byron called *A Fool and his Money*. In the early eighties such well-known writers as Jerome K. Jerome, Sydney Grundy, and Robert Buchanan had productions running. In 1897 Sir John Hare took possession of the theatre, and during his tenancy as many as twelve different plays by well-known

authors were produced. *The Three Musketeers* was given in 1898, and the following year Sir A. Pinero's *Gay Lord Quex*, in which Sir John Hare scored such a success in the title role. The G. T. now stands in a fine position in Shaftesbury Avenue, W.C., and its approximate seating capacity is 1000 people. It is one of the largest of the W.-end theatres. Later plays produced there were *Fallen Angels*, by Noel Coward (1925), *Trelawny of the Wells* (1926); *Canaries Sometimes Sing*, by F. Lonsdale (1928); *The Improper Duchess*, by J. B. Fagan (1931); *For Services Rendered*, by Somerset Maugham, (1932); *Robert's Wife*, by St. J. Ervine (1937); *The Morning Star*, by Emlyn Williams (1941); and *While the Sun Shines*, by Terence Rattigan (1943-46).

Globigerina, name given to a genus of foraminiferous rhizopods, whose shells are found in great abundance on the floor of the ocean, particularly in warm seas. They are of a pelagic, limy formation, having many chambers covered with pores, out of which streams protoplasm. As they die, their shells sink to the bottom and form the calcareous deposit known as the G. ooze.

Globular Clusters, dense groups of stars at great distances. Some sixty are known and each contains thousands of stars. They are believed to be outside our galaxy and to form isolated stellar systems comparable to ours. The best known is that in the constellation Hercules.

Globular Projection, see PROJECTION.

Globularia, genus of the order Solanaceae. They are perennial herbs or shrubby and are cultivated in rock-gardens. The flowers, which are globular, are blue or white.

Glogau, or Grossglogau, tn. and fortress of Poland in Upper Silesia (formerly of Prussia) on the l. b. of the R. Oder, 32 m. from Liegnitz. Its cathedral, on an is. in the Oder, is connected with the tn. by a wooden bridge. Fortified since about 1000, it has withstood sev. sieges. It is noted for manuf. of sugar, starch, pottery, and agric. machines; and its book trade was celebrated. The tn. was taken by the Russian forces on April 1, 1915.

Gloss (Gk. γλωσσα, tongue, language), or **Glose**. Originally an explanation of merely verbal difficulties in a literary work (such as words taken directly from a foreign tongue, provincialisms, obsolete and technical terms, dialect words, or those used by the author with some exceptional meaning), inserted between the lines or written in the margin beside the passage. The earliest Gs. (Gk., Lat., and Heb. MSS.) were interlinear, later they became marginal, and finally developed into a running commentary on the whole book. *Glosse* came to be applied to similar explanatory renderings of words or passages in any dictionary or annotated work, hence our word ‘glossary.’ In a sinister sense G. may mean a sophistical interpretation. Collections of Gs. (*glossaria*) were very common in the Alexandrian period (fourth century B.C.). Among the chief Gk. *glossatores* are Philetas of Cos (third century B.C.)

Zenodotus, Aristophanes of Byzantium, Aristarchus, Apion, Hesychius of Alexandria (fourth century A.D.), Photinus (ninth century), Suidas (tenth century), Zonaras (twelfth century), **Favorinus**, a Benedictine (d. 1537). Most of the Rabbinical writers have done for the Heb. text what these did for early Gk. texts. The chief *glossatores* or glossarians of the Lat. Vulgate are **Walafrid Strabo** (ninth century), author of the *Glossa Ordinaria*, and **Anselm** of Laon (c. 1050-1117), author of the *Glossa Interlinearis*, printed in the Vulgate ed. of 1480. A collection of Gs. illustrating the language of scripture was the (*Glossa Sacra Hesychii* . . . of Ernest) (1785-86). In Rom. Law G. means an explanation, not merely of one word, but of the whole intent of the law. The medieval commentators on the texts of civil and canon law were called *glossatores*, the best known being **Inerius** (twelfth century), and **Accursius** (thirteenth century), whose Gs. on the sixth-century Justinian code (*Corpus Juris Glossatum*) ranked almost as high as the code itself. The first glossarium to canon law was that of J. Seneca (Teutonicus), 1212, printed in connection with the *Decretum Gratiani*. Similar collections were made later of the decretals of **Gregory IX.**, the *Liber Sextus*, the *Clementinus*, and the *Extravaagantes*. The *Glossarium ad Scriptores Mediae et Infima Latinitatis* of C. du F. Du Cange (6 vols.), 1733-36, and P. Carpenter's *Supplement* (4 vols.), 1766, are very famous. Seven vols. of the *Corpus Glossariorum Latinorum* of G. Goetz appeared between 1888 and 1907. Gs. on the works of more modern writers are T. Tyrwhitt, *Glossary to Chaucer*, 1775; R. Nares, *Glossary to Shakespeare and his Contemporaries* (new ed.), 1888; and W. W. Skeat, *A Glossary of Tudor and Stuart Words*, 1914.

Glossop, John Collings-Taswell (1868-1931), Eng. vice-admiral. Served in the Australian Navy in the early part of the First World War. He was in command of the Australian cruiser *Sydney* when she sank the Ger. raider *Emden* in Nov. 1914.

Glossop, manufacturing tn. in Derbyshire, England, near the Peak. Noted for paper mills, cotton and calico printing. Pop. 20,528.

Glotto, see LARYNX.

Gloucester, Arthur Cayley Headlam, Bishop of, see HEADLAM.

Gloucester, Dukes and Earls of. The earldom of G. was first conferred on Robert (d. 1147), who won the battle of Lincoln for his sister Matilda against Stephen. In the Clare family, Richard (1222-62) was seventh earl, and fought on the side of the barons under Henry III., till he finally quarrelled with Simon de Montfort. His son Gilbert (1213-35) was eighth earl, surnamed the 'Red.' He fought with de Montfort at Lewes (1264), but against him at Evesham (1265) for Prince Edward. He was regent during Edward I.'s absence from England. Gilbert, ninth earl (1291-1314), fell at Bannockburn. Thomas of Woodstock (1355-97), youngest son of Edward III.,

was made duke of G. by Richard II., 1386. From 1386-89 he was virtual ruler of England. He was put to death at Calais by order of Richard II. on a charge of treason. Humphrey (1391-1447), known as the good Duke Humphrey, was youngest son of Henry IV., brother of Henry V., with whom he fought at Agincourt (1415). He was Protector during the minority of Henry VI. (see K. H. Vickers's life, 1907). He invaded Flanders, 1436; lost his influence over Henry VI. upon the conviction of his wife, formerly Eleanor Cobham, for witchcraft, 1441, and, at the instigation of Suffolk, was arrested, 1447, and d. a few days later. He was a munificent patron of literature and the Church. Richard, son of the duke of York and brother of Edward IV., became Richard III. (1483-85). The last but one to bear the title was Frederick Wm. (duke of G. and Edinburgh, 1778-1834), nephew of George III. The present holder of the title is Henry Wm. Frederick, third son of George V. He was b. March 31, 1900. Known as Prince Henry until 1928, when he was created a duke. He entered the King's Royal Rifle Corps in 1919 but later joined the cavalry. Married, 1935, Lady Alice Scott, daughter of the seventh earl of Buccleuch. Promoted major-general in 1937. Governor-general of the Commonwealth of Australia, 1945-47. Now general and air chief marshal; colonel of the Scots Guards; master of the Corporation of Trinity House.

Gloucester, Robert of: 1. Early Eng. writer (fl. thirteenth century), probably a monk of G. Abey. He wrote in verse a *Chronicle of England* from the earliest times down to the reign of Henry III. See selections from his *Chronicle* in G. Sampson's *Cambridge Book of Prose and Verse*, 1921. See also W. Ellmer, *Über die Quellen der Reimchronik Robertis von Gloucester*, 1886; the Rolls Series ed. of the *Chronicle*, ed. Aldis Wright (2 vols.), 1887; and B. D. Brown, *Robert of Gloucester and Life of Kenelm*, 1926. 2. Illegitimate son of Henry I., earl of G. (d. 1147), b. in Normandy. He was made earl about 1121, and in 1139 headed a rebellion in the W. of England, supporting the claim to the throne of Matilda and her son Henry against that of Stephen. His efforts were unsuccessful. Robert was a great patron of letters.

Gloucester: 1. Cap. of Gloucestershire, England, an inland port, city, and co. bor. of note. It is built on a slight declivity, sloping towards the Severn, and is sheltered by the Cotswold and Malvern Hills. Its prin. building is the cathedral, the foundation of which dates from the eleventh century, but which has been restored since 1873. It was at one time a monastery church. G. has sev. schools, three endowed anot. ones, and sev. modern. It is governed by a mayor, aldermen, and burgesses. Its chief manufs. are aircraft, railway engines, agric. implements, cutlery, etc., and it exports, iron, coal, bricks, pottery, salt, malt, and agric. products, carrying on a large trade with the Baltic and other foreign ports. It also has fine ship-

building yards, foundries, marble and slate works. The salmon fisheries in the Severn are valuable. G. returns one member to the House of Commons. Pop. 61,700. 2. In Massachusetts, U.S.A., a city and port of entry of Essex co., 32 m. N.E. of Boston. It was founded in 1623, chiefly by settlers from G. in England whence it derived its name. In 1642 it was incorporated as a tn., and in 1871 became a city. It is governed by a mayor, elected annually. The oldest Universalist church in the U.S.A. is situated in G., founded in 1770. From the beautiful



British Railways
THE FIFTEENTH-CENTURY TOWER
OF GLOUCESTER CATHEDRAL

dark granite quarried in the neighbourhood the Woolworth Building, New York, and some gov. offices are built. G. is noted as being one of the most important fishing ports and markets in the world, 6000 men being engaged in the trade. The prin. entitles are herring, cod, mackerel, and halibut. G. also has large manufs. of oil, shoes, machinery, cigars, twine, etc. Pop. 21,000, which increases by summer holiday traffic. 3. A city in Camden co., New Jersey, U.S.A., on the Delaware R. It was incorporated in 1868, and is governed by a mayor, elected every two years, and by a unicameral council. It is connected with Philadelphia by ferry. The manufs. include cottons, calico prints, woollen yarns, Welshbach lights, and boats. It has a shipyard. Pop. 13,600.

Gloucestershire, co. of England in the 16th Midlands, bounded by Worcester-
as two.

Oxfordshire on the E., by Wiltshire and Somersetshire on the S., and by Monmouthshire and Herefordshire on the W. Its area is 1258 sq. m. The co. is irregular in outline, but is marked into three distinct physical divs., viz. the hills, the vale, and the forest. The E. part of the co. lies among the uplands of the Cotswold Hills; the W. part overlooks the rich valley of the lower Severn, known as the Vale; and the beautiful and historic Forest of Dean lies between the Wye and the Severn. The greater part of the total area is under cultivation; the vale dist. is particularly adapted for pasturage, and the moist climate is favourable to the growth of root crops, wheat being the chief grain raised. The cattle are mostly shorthorns, reared for both distant markets and dairy purposes, G. being famous as a dairy co. It is the vale dist. which produces the celebrated double Gloucester cheeses, and it has long been celebrated for its cheese and butter. From its orchards large quantities of cider are obtained; the apple and pear orchards attached to nearly every farm are quite a feature of the co. Sheep-farming is carried on largely in the Cotswold (q.v.) dist., and this has led to the manuf. of woollen cloth, the kind principally manufactured being broadcloth, made in all shades of colour. Stroud is the chief centre for a number of manufacturing vls. Machinery, tools, paper, furniture, pottery, and glass are produced. Iron-stone, clay, limestone, and sandstone are worked, and the Forest of Dean has some iron deposits and important coalfields.

G. is served by two railway systems, the main line of the W. Region of Brit. Railways serving Bristol from London. The coalfields of the Forest of Dean are served by sev. branch lines. G. is in the Oxford circuit and assizes are held at Gloucester, the co. tn. It is principally in the diocese of Gloucester and has four parl. divs. It contains the parl. bor. of Cheltenham and Gloucester and six bor. constituencies of Bristol. (See Victoria Co.-Lists, *Gloucestershire*.) Chief antiquities of the co. are the celebrated cathedrals of Gloucester and Bristol, the famous abbey church of Tewkesbury, and the church of Cirencester. Most of the old mkt. tns. have fine parl. churches, those in Cleeve and Cheltenham being of special interest by reason of the pre-Norman work they retain.

As already shown, the physical characteristics of the three natural divs. of G. have given rise to a special industry in each. The woollen trade of the big tns. has been gradually absorbed by the hill dist.; and in the prosperous Stroud valley silk-weaving was introduced in the seventeenth century. During that century and the next numerous minor industries sprung up, including flax-growing and the manuf. of lace, rope, sailcloth, stockings, etc. The abundance of clay and building-stone in G., too, has given rise to the manuf. of tiles, bricks, and pottery. Celestine (q.v.) is found near Glosgreen hamlet.

As regards geological formations, no co. in England has a greater variety. Gneissic

rocks are found at the S. end of the Malvern Hills, and the oldest stratified rocks of the co. are to be found in a patch of greenstone at Damory, Charlfield, and Woodford. A series of sandy shales and sandstones is quarried at Dynock, and the Old Red Sandstone occurs in sev. places in the Bristol coalfield. The Penarth series consists of grey marls and black paper shales, containing much pyrites and a celebrated bone bed, the Cotham landscape marble, and the White Lias limestone. The co. has no higher Secondary or Tertiary rocks, but is represented by the Quaternary series. Dover's Hill, a spur of the Cotswolds between Chipping Campden and Weston-sub-Edge commands extensive views over the vale of Evesham. This vantage-ground was bought, largely by public subscription, during 1928 and 1929. Land was also bought in 1933 though funds provided by the Pilgrim Trust, to preserve the surroundings of the church of Chipping Campden and Old Campden House. Pop. 874,700. See W. Jones (editor), *Transactions of the Bristol and Gloucestershire Archaeological Society*, 1900; A. Gissing, *Footpath-way in Gloucestershire*, 1924; G. B. Grundy, *Saxon Charters and Field Names of Gloucestershire*, 1935-36; K. Haro, *Gloucestershire*, 1918; and II. Stratton David, *Babson's Little Guide to Gloucestershire*, 1949.

Gloucestershire Regiment. Formerly 28th and 61st Foot. The 28th was raised in 1694, and took part in Marlborough's campaigns, and was at the battle of Fontenoy (1746). Thence it went to America on service. As 'The Old Braggs' and 'The Slashers' it gained great renown in the eighteenth century. At Alexandria in 1801 it gained the unique distinction of being permitted to wear a badge at the back of the head-dress as well as in the front. This was in commemoration of the fact that it was attacked by Napoleon's Invincible Legion both in the front and the rear but defeated the legion with great loss. A few years later it was with Wellington in the Peninsula and at Waterloo. The 61st was raised in 1755, and saw service in the W. Indies, Maida, Peninsula, and the Indian Mutiny. These two regiments were linked in 1851 to form the G. R., which fought in the S. African war, 1899-1902. During the First World War it raised twenty-four battalions, which served in France, Flanders, Italy, Macedonia, Gallipoli, Egypt, Mesopotamia, and Persia. In the Second World War the G. R. fought in N.W. Europe and in the Far E. Took part, in Feb. 1945, in the heavy fighting on the Canadian Army's front at the Siegfried and Maas R. defences. Other units of the regiment formed part of the 49th Div., captured Nijmegen in Belgium on Oct. 26, 1944, and, with the Essex Regiment, won the bridgehead over the R. Maas (Nov. 1944).

Glove (O.E. *glaf*), covering for the hand, usually with a separate sheath for each finger. The use of Gs. was apparently known in the earliest times, and references are made to it in classical hist. In the eighth and ninth centuries the use of Gs.

Glow-worm

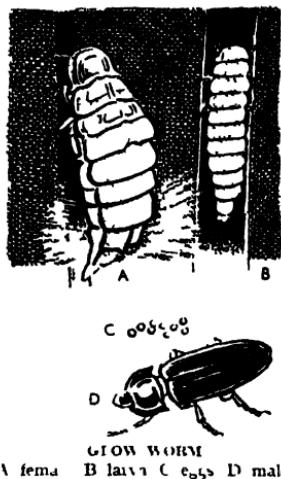
was almost universal among the Gers. and Scandinavians, though usually of the fingerless kind; but there is no evidence to prove that Gs. were in use in England till the thirteenth century. They were then first worn by ladies as ornaments, sometimes being made of linen and reaching almost to the shoulder. It was Queen Elizabeth who set the fashion of wearing them richly embroidered and jewelled. During the Middle Ages the G. obtained a special significance in the symbolic sense, the custom of offering a folded G. as a gage for waging one's law coming into use. Associated with this custom was the use of the G. in a wager of battle, when it was thrown down by the defendant and picked up by the accuser, in open court, signifying a challenge and its acceptance. The manuf. of Gs. was not introduced into Great Britain till the tenth or eleventh century. A speciality of the Eng. manuf. is the so-called 'dog-skin' G., made from the skin of the Cape sheep. The chief seat of the leather-G. manuf. is at Worcester, though they are also made to a considerable extent at Ludlow, Yeovil, and Woodstock, and they are distinguished for their durability. An immense number of Gs., especially of the kid variety, are made in France, where they are noted for their elegance and neatness. Dan. ladies' Gs. are also famous. The manuf. is also carried on in Brussels and Berlin; and in the U.S.A. many grades and varieties are made in the large manufactories.

Glover, Richard (1712-85), Eng. poet, son of a London merchant, educated at Cheam, Surrey. He was M.P. for Weymouth, 1762-8. He wrote some verse in praise of Sir I. Newton (1728), and his blank verse epic, *Leondis*, appeared in 1737 (extended to 12 vols. by 1770). The *Athenaid* (a sequel, 30 vols.) was pub. posthumously in 1788. His works are mostly forgotten now. Others were the tragedies *Boadicea* (1753); *Medea*; 1761); *Jason* (1779); and the *Ballad of i'miral Hosier's Ghost* (1720), intended to excite the Eng. against Spain. G.'s diary was pub. in 1813. See A. Chalmers, *Works of the English Poets* (vol. xvii.), 1810; J. G. Schneaf, *Richard Glover, Leben und Werke*, 1900.

Gloversville, city of Fulton co., New York state, U.S.A., 43 m. N.W. of Albany. Noted for the manuf. of gloves and mittens and glove and shoe leather. Pop. 23,000.

Glow-worm, name applied to various luminous beetles of the sub-family Lampyridae. There are about 500 species. They are nocturnal in habit, and found chiefly in warm countries. The phosphorescent structure is on the abdomen, and the lights apparently serve as love-signals between the sexes, to light the path of the beetle and frighten off foes. The most common European variety is the *Lampyris noctiluca*. The female is usually wingless; the males, eggs, larvae, and pupae are all luminous. In this variety alone the female's light is more brilliant than the male's. Other species are *Lampyris splendidula*, the W. Indian

Photuris and *Pygolampis*, Amer *Pyracantha*, *Pyrocoelia*, *Luciola*, *Lamprocerus*, and *Photinus pyralis* See FIREFLY, PHOSPHORESCENCE



Gloxinia, bulbous plants of the order Gesneriaceae. All species are indigenous to tropical America. They are very popular in Britain, being one of the handsomest of stove and greenhouse (heated) plants. They are usually propagated from seeds, which, if sown in spring or about the second week in March will bloom in autumn. Tubers can be flowered at almost any season five to six months from planting. Many cultivars have been derived from the species. The large trumpet-shaped flowers are single on strong stems above the large ovate leaves. They are tubular with wide, richly coloured rims speckled, marbled, blotched, or whole colour.

Glubb, John Bagot (b. 1897), Eng soldier. After service in the First World War he was political officer in Iraq working among Arab tribes on the Saudi Arabian frontier. In 1932 he was transferred to Transjordan and put in command of the Arab Legion. His name will always be associated with the formation of the 'desert patrol' and system of forts on the Transjordan Palestine border. During the Iraqi campaign of 1941 (see under IRAQ) he was attached to the Transjordan Frontier Force and took part in the operations in the Hauran area, and, in the Syrian campaign later in the year, he took part in the operations in N.E. Africa and at Palmyra. Known among the Arabs as Abū Ḥilmuk or 'Father of the Jaw.' He wrote *The Story of the Arab Legion* (1948).

Glubczyce (Ger Leobschutz), tn. in the prov. of Polish Silesia, on the Zinna, 10 m. N.W. of Ratibor. Pop. 13,300.

Glucinum, see BERYLLIUM

Gluck, Christoph Willibald (1714-87), operatic composer, may be credited with having rescued opera from the degeneracy to which it had sunk under the influence of the early eighteenth century 'It school', who wrote purely for the display of vocal technique—thereby preparing the way for its subsequent development by Wagner. G. was the first composer to study the deeper aesthetic possibilities of opera as an art form in his ideals, like those of his successor Wagner, who framed on the lines of the Greek drama, and aimed at making music the expression of sincere passions and profound sentiments. The music of his 'reformed' operas is an application of these ideals; it is subservient to the libretto, and psychological in a manner that would now be deemed superficial, although at the time it was in unheard of innovation and the orchestra represents with noble breadth and dignity of style and austere simplicity of colouring the emotional degrees of the poetry. Further the overtures are synoptic programmes of the operas. G.'s only efforts were ill in the It style (*Orfeo* being the first of every successful series in Milan, Venice and Turin (1741-3)). He then came to England, but was overshadowed by Handel who was then at the zenith of his popularity and failed to win recognition. It was in Vienna that his first significant opera *Orfeo* (1761) was produced, meeting with great and immediate success. In this work, which may be regarded as the germ of the modern musical drama, are seen the more or less tentative ideas which found full expression in *Alceste* (1767), *Iphigénie en Tauride* (1770), *Ismilde* (1777), *Iphigénie en Aulide* (1779), this latter being the weapon which gave G. victory over Piccinni the rival composer of the 'It school' in the quarrel melted between them by the 1770s courtiers under Marie Antoinette and Mme du Barry respectively and finally *Le Cho et Narcisse* (1779).

Glucose, see Dextrose

Glue (O Fr. *glu* birdlime), impure gelatine which is used for its adhesive properties. It is made from the refuse of tanneries such as parings of hocks, ears and tails of oxen and sheep, and from the skins of calves, cats, dogs, rabbits, hares, and other animals though oxen and sheep are preferred. The hide is washed in tanks of lime water or soda solution for two or three weeks until the hair is removed. The gelatinous substance is obtained by melting the hide in an open boiler. The glumstock is then boiled in water, the quality of the G. depending on the amount of water used. Any stock left after the contents of the boiler have been passed through a clarifying vat is reboiled with a fresh quantity of water to make an inferior quality of G. The gelatinous fluid is placed in wooden congealing boxes until it is solidified into firm jelly, when it is removed, cut up into slices by a wire or a wet knife, and dried in the open air on netting stretched over frames. The cakes should be carefully watched, as changes in the weather

may bring about partial or total decomposition of the G. The drying is finished indoors by currents of air. The cakes are redipped in water and allowed to dry again, which gives them a bright, polished appearance. A very fine quality of G. is made in Scotland. There are various other kinds of G., e.g. bone G., made from bones, fresh or boiled, and fish G., made from the skins of fish. Marine G. is a cementing composition, made of a solution of India-rubber and coal-tar naphtha, powdered with shellac. It is often used instead of tar.

Synthetic resin glues are of four main types. Those made from (1) phenolic and other heat-setting resins, used where speed and waterproofness is necessary for gluing wood; (2) vinyl and other heat-softened resins, mainly used on leather, rexine, and transparent film materials, though they have a great variety of uses both in emulsion and solution form, and also as hot melts; (3) cellulose derivatives, used for making transparent bags, window cartons, etc.; (4) synthetic rubbers and other miscellaneous resins: these have specialised uses on metals and other impervious surfaces.

Glutathione, *see* *at* *HOPKINS, Sir FREDERICK GOWLAND*.

Gluten, one of the most important constituents of wheat flour, is obtained from it by kneading a paste of the flour under water in a linen bag, until no further unwhiteness is produced. The grey, tasteless substance remaining consists mainly of G., which may be separated into vegetable fibrin, which is soluble, and gliadin, which is insoluble in alcohol. Oats, rye, and barley scarcely contain any G., whereas the proportion in wheat varies from 10 per cent in cold to 15 per cent in hot climates. It has a high food value, and contains from 15 to 18 per cent of nitrogen in addition to carbon, hydrogen, oxygen, and sulphur. G. plays an important part in the manuf. of bread by preventing the escape of carbon dioxide from the dough, thus rendering wheaten bread lighter than that prepared from rye and other flours.

Glutton, or Wolverine (*Gulo luscus*). The former name is somewhat of a misnomer, since the animal is no greedier than are the other species of the same genus. It belongs to the weasel family and has most of the characteristics of that family. It resembles somewhat the European badger, being from 2 to 3 ft. long, plus a bushy tail of about 8 in. It has blackish-brown fur, with a broad band of chestnut fur running along each side of it. It exists in both hemispheres, but is found principally in the Arctic regions of N. America, especially in Alaska and round the MacKenzie R. The flesh is useless, but the furs are made into bearh- and carriage-rugs.

Glycas, Michael, Byzantine historian. The date of his birth and the period during which he wrote are very obscure, but he was noted amongst the historians of the E. Empire for the terseness and clarity of his style. Some letters which are supposed to have been written by him to Constantine still exist, though their

authorship is dubious. His best known work is *Ikōs Xpovikī*, which treats of the hist. of the world from the creation to the death of Alexius I., Comnenus.

Glycerine, more correctly called *Glycerol*, or, in chemical terminology, *Trihydroxy-propane* ($C_3H_5(OH)_3$), is an essential component of the fats and oils of both vegetable and animal origin. These fats and oils are mixtures of the glyceryl esters of the fatty acids, and on treatment with hydrolysing agents (e.g. alkalis, superheated steam, etc.) they are split into either G. and the alkali salt of the acids, or G. and the free fatty acids. A similar decomposition is effected in the intestine, the G. and fatty acids being absorbed separately and again reconverted into fats. The prin. sources of G. are stearin (the main constituent of the harder fats such as beef and mutton tallow), palmitin, present in palm oil and other oils, and olein, which is found in the soft fats and oils, including lard. G. is prepared almost entirely as a by-product in soap manuf. The fat is treated with alkalis, and the soap (i.e. the alkali salt of the fatty acid) is salted out; in the residual lye is found all or most of the G. present in the original substance. This lye is filtered from impurities, concentrated *in vacuo*, and then distilled under reduced pressure. Chemically pure G. is obtained by diluting the crude product with water and removing by distillation the acid products that pass over at 100–110°C. The temp. is gradually raised to 170°, when the G. distills over. G. is a colourless, viscous liquid with a sweet taste which crystallises at low temps. Sp. gr. 1.1320, boiling point 290° with decomposition. On rapid heating it loses water with the formation of acrolein. G. is used in enormous quantities for the preparation of nitro-G. and explosives related to the latter, e.g. dynamite. It is also employed to a large extent in dyeing, calico-printing and dressing, in the manuf. of leather, and in pharmacy and medicine generally. Because of its non-drying and antiseptic properties it is used as a lubricant for watches, etc., and since it does not freeze when mixed with water it forms a valuable filling for gas meters and motor-car radiators.

Glycocoll, or *Glycine*, is aminoacetic acid ($CH_2NH_2(OOH)$), a sweet, crystalline body (melting point 232° C.), and was first obtained from the products of the action of sulphuric acid on glue, but is more conveniently prepared by the action of ammonia on monochloroacetic acid. It forms compounds with both acids and bases.

Glycogen, or *Animal Starch* ($C_6H_{10}O_5$)_n, discovered by Bernard in 1857, is found in the livers of animals, where it is probably stored as a reserve material. It is a white tasteless powder, giving a red colour with iodine, and is converted by ferment into D-glucose and by acids into glucose. *Pâté de foie gras* and oysters contain a considerable amount of G.

Glycol, or *Ethylene Alcohol* ($CH_2(OH)CH_2OH$), first and best known of the series of dihydric aliphatic alcohols,

Glycon It is prepared from ethylene dibromide by boiling with potassium carbonate solution, and is a sweet syrupy hygroscopic liquid, boiling at 197° C., and freezing to a crystalline solid at -17° C. It is used in the manuf. of high explosives.

Glycon of Athens, Gk. sculptor of uncertain period, famous for the colossal statue of the Farnese Hercules found in the baths of Caracalla in 1540, with the inscription 'Glycon the Athenian made it engraved on the rock supporting it. The statue was probably executed in the first or second century of the Rom. Empire.

Glycosmis, name of a genus of rutaceous plants indigenous to the tropics. It contains six species, of which *G. citrifolia*, the Jamaica orange, is the best known.

Glycosuria. The literal definition of this word is sweet urine, and it is used to designate a state in which chemical tests show sugar to be present in the urine. G. is of common occurrence, and may be due to excessive consumption of sugar or inability of the individual to utilise the sugar and starch in food. It is often associated with mental trouble, disease of the brain, liver, or kidney. The severity of G. is estimated by the amount of sugar excreted, and the presence or absence of increased thirst. The condition is not infrequently found on examination and should be looked upon as an indication of the necessity of regulating the diet. This should be done by diminishing the amount of articles of diet containing sugar and starch, that is flour and generally vegetables grown underground. Saccharine should be taken instead of sugar in beverages, such as tea and coffee, and other articles of diet. The significance of G. consists in the fact that it may be an early symptom of the disease known as diabetes.

Glydry, rocky abrupt mass of mts. (Glydry Fach and Glydry Fawr) set in the middle of the most beautiful scenery of N. Wales. Starting at Pen-y-Pass they go down the flank of the Snowdon valley to Capel Curig. On their N. side they are precipitous and more interesting to the rock-climber. There is some grass and heather, and about 3000 sheep graze on them, but mostly the G. are utter rock. 'Plies of boulders, cliffs of glacier-scarred rock, rising ridge upon ridge, until you reach that incredible climax on the top of the Little Glydry... It is as if the Glydry did once have a beautifully peaked top, and then some great explosion blew the peak to pieces,' leaving 'pile upon pile of great rock slabs, great monoliths of rock that would do credit to Stonehenge, slab upon slab, all balanced precariously' (E. Firbank). Lyn Caege Fraith, a very small lake, lies just below the Little Glydry. The famous Llanberis Pass runs from Snowdon in the direction of these hills, Idwall Lake, and other fascinating spots, are within easy range.

Glyn, Elinor (1865-1913), Canadian novelist, youngest daughter of Douglas Sutherland, a brilliant Toronto engineer who d. of typhoid while at work on the Mont Cenis tunnel. She spent part of her youth in Canada, her grandmother, a true survivor of the *ancien régime*, exerting a

strong influence on her upbringing. Her husband, Clayton G., she describes as 'instinctively the perfect grand seigneur,' and she modelled her fictional heroes upon his kind. Novels flowed from her pen for thirty years. Her earliest was *The Visit of Elizabeth* (1900)—said to have been built up on her diary—which at once made her name. The best known, however, was *Three Weeks* (1907) and the best designed *The Career of Katherine Bush* (1917). Beneath her air of extreme sophistication and the cultivation of the *risqué*, she was at heart a romantic, and her novels which, judged by contemporary standards of reticence, seemed daring, served but to point the way to writers of far wider and ampler licence.

Glyncoedwrg, urb. dist. of Glamorganshire, situated 8 m. W.S.W. of Aberdare. It has coal- and iron-mines. Pop. about 10,000.

Glyndebourne Festival Theatre, founded in 1931 by John Christie on his estate at Glyndebourne, near Lewes, Sussex. Opera performances of a high standard are given, notably of Mozart. The theatre is made accessible to London opera-goers by a special train service.

Glyptodon (Gk. γλυπτός, curved, and ὀδον, tooth), name of a genus of fossil Dasypodidae or armadillos, found in the post-tertiary deposits of S. America. They are characterised by their great size and by thick, solid carapaces, which in some cases are nearly 6 ft. long; the head is sheathed in bony plates, so also is the long tail. *G. claviger* and *G. reticulatus* are the best known species.

Gmelin, name of a distinguished family of Ger. scientists:

Johann Georg G. (1709-55), b. at Tübingen. In 1749 he was appointed prof. of botany and chem. at Tübingen. He pub. *Flora Sibirica* (1747-49) and *Rise durch Sibirien* (1751-52).

Samuel Gottlieb G. (1711-71), nephew of Johann Georg G., b. at Tübingen, and appointed prof. of botany in St. Petersburg in 1767. He wrote *Historia Fucorum* (1768).

Johann Friedrich G. (1748-1804), nephew of Johann Georg G., who pub. a botanical dictionary entitled *Onomatologia Botanica Completa* (1771-77).

Leopold G. (1788-1853), chemist, son of Johann Friedrich G., b. at Göttingen. He studied medicine at Göttingen and Tübingen, and taught chem. at Heidelberg. He was the discoveror of red potassium prussiate and he wrote many scientific works, amongst which is *Handbuch der Chemie* (1817-19); this was trans. into Eng., 1848.

Christian Gottlob G. (1792-1860), nephew of Samuel Gottlieb G., was prof. of chem. at Tübingen, and was also the discoveror of an artificial process for the manuf. of ultramarine.

Gmünd, tn. of Germany in Württemberg-Baden. It is situated on the Rems, 28 m. N.E. of Stuttgart. It manufs. woollens and cottons, jewellery, trinkets, etc. Hops and fruit are grown in the neighbourhood. There is a noted pilgrimage chapel in the vicinity. Pop. 59,100.

Gnat, genus of small dipterous flies of the family Culicidae, very common in marshy districts. There are nine British species, the *Culex pipiens* being the common G. Mosquitoes are included in the family, but are larger in size and bite more effectively.

Gneisenau, August Wilhelm Anton, Graf Neithardt von (1760-1831), Prussian general, b. at Schildau, near Torgau, in Prussian Saxony. After studying for two years (1777-79) at the Erfurt Univ., he joined an Austrian regiment. In 1782-1786 he fought among the Ger. auxiliary troops on the side of England in the Amer. War of Independence. On his return he became a Lieutenant in the Prussian Infantry, and served in Poland (1793-94). He fought at Saalfeld and at Jena in 1806, and defended Colberg in the following year. His gallantry was formally recognised, and he received the order *pour le mérite*. During the War of Liberation he fought with distinction at Leipzig in 1813, and still further increased his military reputation on Blücher's staff during the Waterloo campaign of 1815. In 1831 he was appointed a field marshal of the Prussian Army and put down the rebellion in Poland, but he fell a victim to cholera and d. at Posen in Aug. of that year. See lives by G. Pertz and H. Delbrück (1864-1880), and W. von Unger, 1911.

Gneisenau, one of the five Ger. cruisers of Adm. von Spee's squadron at the battle of Coronel (q.v.). A 'pocket battleship,' built on Hitler's accession to power, was given the same name. In the Second World War it was bombed in Kiel harbour by the R.A.F. in 1940-41. In Brest harbour it was bombed on many occasions by allied aircraft, but on Feb. 11-12, 1942, together with the *Scharnhorst* (q.v.) and *Prinz Eugen* (q.v.), succeeded in escaping to Germany, where, however, it was soon put out of action. See under NAVAL OPERATIONS IN SECOND WORLD WAR.

Gneiss, name given to a family of metamorphic rocks which contain (essentially) the same mineral elements as granite, that is, felspar, quartz, and mica, but differ in the foliated arrangement of their constituents. The minerals alternate in light and dark layers, which are sometimes so distinct as to give the appearance of stratification. There are many varieties of forms, from the true granite to the schistose condition; in *hornblende* G. hornblende takes the place of, or is associated with, mica; in *graphite* G. it is graphite that takes the place of mica. In some varieties the felspar occurs in large distinct crystal masses, or kernel-like masses forming *porphyritic* G. Some G.s. are undoubtedly of eruptive origin and others have resulted from the metamorphism of sediments; they are the most widely distributed of metamorphic rocks and are found in almost all parts of the world.

Gneiss Islands, see HANJARIS.

Gneist, Heinrich Rudolf Hermann Friedrich von (1816-95), Ger. jurist, b. in Berlin. He studied at Berlin Univ., where he took his degree of *doctor iuris* in 1838. In 1841 he was appointed assessor to the

Kammergericht, or supreme court, and rose to be an assistant judge. In 1844 he became extraordinary prof. of Rom. law at Berlin, and retired from his judicial life in 1850 in order to devote himself to teaching and to politics. He sat in the Prussian Lower House among the National Liberals, and from 1858 to 1863 sat in the Abgeordnetenhaus, or House of Deputies of the Prussian Landtag. He wrote voluminously on political subjects and on constitutional law. His works, many of which have been trans. into Eng., include *Die formellen Verträge des heutigen römischen Obligationen-Rechtes* (1845); *Adel und Ritterschaft in England* (1853); *Das heutige englische Verfassungs- und Verwaltungsrecht* (1857-63); *Budget und Gesetz nach dem constitutionellen Staatsrecht Englands* (1867); *Zur Verwaltungsreform in Preussen* (1880); *Englische Verfassungsgeschichte* (1882); *Das englische Parlament* (1886); and *Die verfassungsmäßige Stellung des preussischen Gesamtministeriums* (1895). See lives, by O. Gierke, 1895, and E. Schiffer, 1920.

Gnidus, see CNIDUS.

Gniezno, tn. in the prov. of Poznan, Poland. It has a fine Catholic cathedral in the Gothic style, dating from 965, in which the Polish kings were crowned till 1320. It was rebuilt in 1760-90. The tn. numbers among its industries linen and cloth weaving, brewing, and distilling. The archiepiscopal see was founded by the Emperor Otto III. in 1000. The tn. came under the rule of Prussia in 1815. Came under independent Polish government by peace treaty, 1919. Pop. 30,000.

Gnome (Gk. *γνῶμη*, an opinion), maxim or proverb. The Gnostic poets of Greece (*γνωμονικοί*) flourished in the sixth century B.C.; wrote sententious and pithy maxims in the elegiac distich, and included among their number Theognis of Megara, Solon, Simonides of Amorgos, Xenophanes, and Enneas. The Gnostic spirit is prevalent in a great deal of oriental literature, and was popular among the early Germanic peoples. A fair number of O.E. proverbial sayings, strung somewhat inconsequently together, may be found in the Exeter Book and in the Cambridge Cotton MS. and are known as Gnomic verses. Francis Quarles (1592-1644), who directly imitated the Gk. Gnomic writers in his *Quatrains* (pub. 1574), is one of the latest writers to use this particular form.

Gnomes (Fr. *gnomes*, Ger. *gnomen*), in folklore, are spirits of the earth and mt., who are supposed to conceal treasure in their subterranean dwellings. The word is supposed to have originated with Paracelsus, who used it as synonymous with *Pymæi*, and derives it from Gk. *γνῶμη*, intelligence. They are of both sexes. The male gnomes are generally represented as a tiny, semi-deformed, bearded creature, clothed in a tight, brown tunic with a peaky hood. They are impish and mischievous, but not malignant sprites. It is probable that the fanciful idea of G. really originated among Teutonic tribes of normal stature with regard to some dwarfish neighbours. The

aborigines of Transylvania were a swarthy race, largely inhabiting caves, and the suggestion is that they may have given rise to the imaginative superstitions with regard to G. and such fairies. The Transylvanian gypsies fear an 'earthman' whom they call *phurush*, and who is supposed to steal unbaptised children.

Gnomonics, see HOROLOGY, Sun-dials.

Gnosticism (Gk. γνῶσις, knowledge), widespread spiritual movement which existed before Christianity, and was a kind of religious philosophy which attempted to interpret paganism and Judaism by revealing the deeper knowledge of God which lay in the creeds but which only the initiated (Gnostics) came to perceive and understand. This same spirit of seeking a higher and secret knowledge attacked Christianity in its turn, and so there were Christian Gnostics. For them γνῶσις meant a secret and higher interpretation of the gospels, distinct from the ordinary beliefs (*μόρις*) of the Christians. They claimed that they had received their revelation by a secret tradition, through the disciples, from Jesus Christ Himself, and jealously guarded their knowledge from the uninitiated. They set aside the realistic eschatology of the early Christian Church. As in so many mystic religions, G. is individualistic. The ultimate object was the salvation of the human soul, redeemed from matter by religious knowledge, and not, as in Christian doctrine, by the death of the Saviour. Sacraments of water, fire, food, etc., formed a significant part of the religion. Their teaching was an amalgamation of diverse points from later Gk. philosophies and oriental religions. The Divine Demiurge, the Creator of the world and the Law-Giver of the O.T., was distinguished from God, the Supreme Being. They believed that all things emanated from the Divine First Cause; that God is separated from man by a hierarchy of mons (or spirits) and by companies of demons and deities, the highest duty of man being to unite himself with the First Source of Spirit through gnosis. The soul, on its passage to God, must overcome the intervening gulf by means of secret formulae and symbols (see Lipsius, 'Gnosticismus,' article in Erich and Gruber's *Encyclopädie*, republished in a revised form with the title *Der Gnosticismus; sein Wesen, Ursprung und Entwicklung*, 1860.). They distinguished Jesus Christ, as the final and perfect Aeon between man and God, from the visible manifestation of Himself on earth. His life was regarded as a real human life, with which He deliberately associated Himself, or as a 'psychical' creation. The Gnostics divided men into three grades, the *Pneumatic* (*πνευματικός*), or 'spiritual'; the *Psychic* (*ψυχικός*), or 'soulish'; and the *Hyle* or 'material' (*σωματικός*), which last are doomed to perish. They laid great stress on asceticism or denial of the sensuous world, among early Christians, which with them was developed into extremes of self-abnegation or of libertinism, the latter being advocated by the Marcosians and

Carpocratians. The teaching of Gnostics varied enormously with the *milieu*, pagan, Jewish, or Christian, in which they worked, but the claim that G. was of divine origin, handed down through a chain of initiated disciples, was common; also the hatred for the material world as necessarily evil, and the preoccupation with salvation through acquiring the γνῶσις of the privileged few. The two leading Christian Gnostics were Basilides and Valentine, both in the second century A.D., both founders of schools of G. There is a warning in 1 Tim. vi. 20 against a 'false knowledge,' and it has been suggested that this passage refers to some kind of Gnostic speculation which was troubling the early Christians. The only complete Gnostic work that has come down to us is the *Pistis Sophia*, an Egyptian work of the third century, an ed. of which was pub. by Schwartz and Petermann in 1853. Fragments exist of the works of Bardesanes, a Syrian poet (fl. A.D. 220), and there are certain Gnostic *Acts*, bearing the names of Peter, John, Andrew, and Thomas. Tatian's *Dialessaron* was used as late as the fifth century in the Syrian Church. The works of the Gnostics, Basilides (*Eregetica* and, perhaps, a *Gospel of Truth*) and Valentine (*Psalmi, Homilies, and Letters*), have been lost. The chief authorities on G. are Justin, Ireneus, Tertullian, and Epiphanius. See A. J. Matter, *Histoire critique du Gnosticisme* (2 vols.), 2nd ed., 1843; A. von Harnack, *Zur Quellenkritik der Geschichte des Gnosticismus*, 1873; C. King, *The Gnostics and their Remains*, 1887; H. L. Mansel, *The Gnostic Heresies of the First and Second Centuries*, 1875; G. R. Mead's trans. of *Pistis Sophia*, 1896; W. Bouyer, *Haupproblem der Gnosis*, 1907; L. Duchesne, *History of the Early Church* (trans.) vol. i., 1911; F. C. Burkitt, *The Church and Gnosis*, 1932; and H. Leiseberg, *Die Gnosis*, 1932. The chief attacks upon G. have been collected by Coxo in *Anti-Nicene Fathers* (10 vols.), 1885-96.

Gnosus, see CNOSSUS.

Gnu, or Wildebeest (*Catoblepas*, or *Connochaetes* Gnu), name of two species of antelope. The S. African G. is black in colour with a white tail, and presents a curious mixture of a buffalo, antelope, and horse. Both sexes have horns, which are cylindrical and curve upwards. The brindled G. or blue wildebeest (*Connochaetes taurinus* or *Catoblepas gorgon*) occurs in Bechuanaland, where it is called *kokon*. The G. is a fast runner and in its wild state is very fierce, but may be tamed to do the work of oxen if captured when young.

Gōa: 1. G. ter., a Portuguese settlement on the W. coast of India. It consists of G., containing the cap. Pungim, or Nova G., on the Malabar coast; Dāmão, on the coast about 100 m. N. of Bombay; and Diu, a small is. about 140 m. W. of Dāmão. It is divided into two portions known as the *Vellas Conquistas* (Old Conquests, taken early in the sixteenth century) and the *Novas Conquistas* (New Conquests). It is a hilly region, some of the peaks of the W. Ghats rising

to 4000 ft. The country is intersected by many short but navigable rivers, the largest being the Mandair and the Jnari. One of the chief industries is agriculture, mangoes, bananas, coco-nuts, areca nuts, palm, and spices being among its products. There are a number of salt works both at G. and Damdo and manganese deposits were found in 1906. The chief exports are coco-nuts, fish, spice, salt, and copra. The harbour is good and a breakwater and quay have been added recently. It is connected by rail with India. The prov. is ruled by a governor-general, assisted by a general council and three subordinate councils. Area 1400 sq. m. Pop. 621,100. 2. Tu, founded by Albuquerque in 1511 on the is. of G. It is famous for its beautiful examples of Portuguese architecture. Among its buildings are a majestic cathedral, the church of Dom Jesus (1594-1603), a perfect example of Renaissance style, containing the tomb of St. Francis Xavier, and the chapel of St. Catherine (1551). Pangim was formerly a suburb of the old city. It was made the cap. of Portuguese India in 1843. Pop. 10,000. See J. Saldanha, *Historia de Goa*, 1926.

Goagira, comuni^{cante} i Colombia S. America. It is a peninsula on the N.W. shore of the gulf of Maracaibo, with an area of 4700 sq. m. It became part of the republic of Colombia in 1891. Cap. Puerto Estrella. Pop. 53,800.



GNU

Goalanda, mkrkt. tn. of Bengal, India, situated at the confluence of the Ganges and the Brahmaputra. It is the terminus of the E. Bengal Railway and has a busy riv. trade. There are important engineering works. Pop. (estimated) 20,000.

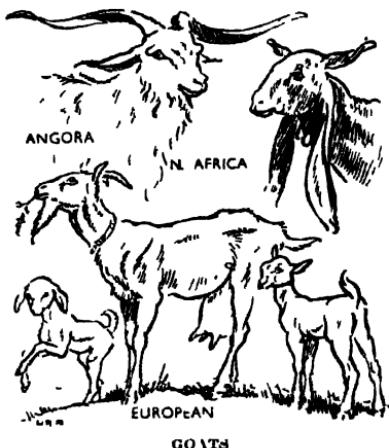
Goalpars, dist. in W. Assam. Fertile but hot and unhealthy. Cap. G., on the Brahmaputra, 85 m. E.N.E. of Rungpur. Pop. about 12,000.

Goat, ruminant quadrupeds of the genus *Capra*, forming, with sheep, the 'caprino' section of the Bovidae family. Most Gs., both male and female, have horns and beards, usually more pronounced in the

male (called the 'billy'), which is characterised by a strong offensive smell, especially during the rutting season. This fact has given rise to the erroneous impression amongst many people that all Gs. have an unpleasant odour. Gs. belong entirely to the old world, but many types have been introduced into Canada and the Americas. They are essentially mt.-loving animals and sure-footed nimble climbers. In their natural state they are chiefly found in small herds in the mt. regions of Europe and Asia. Two species exist in N. Africa and one in S. India, but they are not commonly found below the Himalaya. Remains discovered in the Indian pliocene deposits include those of a hornless kind, the *Bucra davisii*. They feed chiefly on the shoots and leaves of shrubs and trees, and not so much on grass as sheep do. Autumn is the breeding season, the female (usually called the 'nanny') coming into season in Sept. and thereafter at three-weekly intervals until early spring. The kids are usually produced in the spring, commonly two at a birth, the gestation period being about twenty-one weeks. The numerous varieties of wild G. (*Capra hircus*) fall into three groups: the European (see illustration), with up-standing ears, the E., with lop ears or Rom. nose, such as the Nubian, and the smaller wool-bearing breeds, such as the Angora. The varieties include the ibex of the Alps, Himalayas, and Arabia; the bezoar G. or paseng (pasang), probably the parent of the common domestic G.; the tur of the Caucasus; the markhor of the Himalayas; the Sp. G.; and the tahr or G.-antelope (*Hemitragus*). The paseng (*Capra aegagrus*) is the wild G. mentioned by Homer in connection with Crete and the Cyclops. Gs. are useful for their milk (from which cheese is often made), for their skins (which make good leather), and for their meat. Certain breeds are also useful for their wool, in particular the Angora (mohair) and the Kashmere. The two chief varieties of Kashmere Gs. ('variety laniger') are the 'chappoo' and the more common 'changra' which abound chiefly in Tibet and Bokhara. The Angora breed has been introduced into S. Africa, Australia, and U.S.A. The mountain G. from Asia Minor and Tartary, distinguished by its drooping ears, is also bred for its wool.

G. keeping has been practised since earliest times, and the Egyptians, Greeks, and Romans, were familiar with the domestic G., which was probably introduced into Britain by the Phoenicians, although it has never gained the footing in Britain as in other parts of Europe and elsewhere. The milk of the hardy Eng. G. is poor in quality and it has therefore been crossed with other breeds of better yield, a very popular cross being the Anglo-Nubian. Other favoured breeds are the Brit. Alpine, Toggenburg, and Saanen. The milk is chalky white and has no characteristic flavour, provided that the animal is healthy and is kept in hygienic conditions. Gs. can be stall-fed, tethered, or, in uninhabited dists., allowed free range, but for good milk production their diet should include concentrates and

grain, preferably oats. The kids mature very young and will mate at six months, but to produce a good milker a kid dropped in the spring should not be mated until the autumn of the following year. Hornless types have been bred, and the milking strain of some Gs. has been improved to such an extent that they will yield for two seasons, the usual lactation period being ten to eleven months. The Brit. G. Society has done much to improve the strain of the domestic G., which has gained considerable popularity during the last decade, and similar work has been done by the Amer. Milk G. Record Association and by the Canadian G. Society.



Gs. offer a profitable investment to the small holder, yielding up to a gallon or more of milk a day. Domestically Gs. make interesting pets, but on account of their keen intelligence and innate mischievousness they are usually tethered. Gs.'s milk is much richer than that of cows, containing about double the amount of butterfat and as Gs. never contract tuberculosis their milk needs no pasteurisation. It is thus a safe and valuable human food and is highly recommended for babies and invalids by the medical profession. Consult the pubs. of the Brit. G. Society, Schreiner, *The Angora Goat*, 1918; C. J. Davies, *Goat Keeping for Milk Production*, 1920, and H. S. Holmes Peglor, *The Book of the Goat*, 1911.

Goatsbeard, Purple, see SALSIFY.

Goat-moth (*Caixa lyniperda*), large moth, measuring about 3 in. across the wings, common in Europe and W. Asia. It is yellowish-grey or brown in colour, with irregular markings of white and black on the upper wings. The pupa is enclosed in a tough cocoon of chips, from which the moth emerges. When the moth is frightened it emits a disagreeable odour like that of a he-goat, whence its name.

Goatsucker, name given to *Caprimulgus europaeus*, the common nightjar, a picarian

(see PICARIE) bird belonging to the family Caprimulgidae. It is so called because of an ancient and widespread belief that it sucks the milk of goats and other animals, infecting them with disease; this tradition probably originated from the nightjar's habit of seeking insects on pasture-grounds. Other names for this bird are fern-owl, dor-hawk, and night-hawk. It is common in the Brit. Isles during the middle of summer, and is found in various parts of Europe, Asia, and America.

Gobanum, see ABERGWYNNY.

Gobelins, name of a noted Fr. family of dyers. Gilles and Jean (fr. estab. dyeworks at Faubourg St. Marcel, on the Bièvre, about the middle of the fifteenth century. The business flourished, and before long a tapestry manufactory was added to the estab. The beautiful tapestries produced by this firm became celebrated and in 1662 the works were purchased by Colbert for Louis XIV. Le Brun and other famous painters executed the designs for the royal tapestries. The looms were not worked during the revolution, but towards the end of the nineteenth century a fresh impetus was given to the industry, and a second state-supported estab. was opened at Beauvais. See E. Gierspach, *La Manufacture nationale des Gobelins*, 1892.

Gobi, Desert of (Mongolian desert), enormous desert region of China, Central Asia, its exact limits being still somewhat undefined. The Chinese call it Shamo, shabo (sea or riv. of sand), or Hanhai. It stretches from the Pamirs to the Khungan Mts., which separate it from Manchuria on the E., China Proper bounds it on the S., and Mongolia on the N. The W. part between the Yarkand Darla (Tarim) and Lob Nor is called the Takla Makan desert, and E. of Lob Nor comes the 'Great' G. Other parts with special names are the Ordos G. (N. loop of Hwang-ho), Calbun G. (N.W. of Ordos), Alashan or Luan G. (W. of Ordos), Gashun G. (W. of oases from Nganxi chou to Baikul). The surface is in some parts composed of masses of loamy, coarse, shifting sand, in others of rocky masses and mt. heights. The great plateau is from 3000 to 5000 ft. high. In the L. there is some vegetation, and regular caravan routes cross the desert, the chief being that between Kiakhta and Peking via Urga and Kalgan. Nomad Buddhist tribes live in the interior, but all permanent settlements are towards the N. Remains of buried habitations and ins. have been found in the sandy parts. The streams appear to have no outlet to the sea, the most important being the Tarim. The total area is about 300,000 sq. m., average breadth 400 m. Information has been obtained from the explorations of Ney Elias, Przhevalski (Prjevalski), Kozlov, Grum-Grzhimailo, Robos rosky, Bogdanovich, Plovstov, Dr. Sven Hedin, and Dr. Stein. Early explorers were Marco Polo (1254-1324), Tschilbin, the Jesuit (seventeenth century), the Spaniard Ysbrand Ides (seventeenth century), and Lorenz Lange (eighteenth century). See N. M.

Przhevalski, *Mongolia*, 1876, and *From Kulja across the T'ian-shan to Lop Nor*, 1879 (both trans. by E. Delmar Morgan); Sir F. E. Younghusband, *The Heart of a Continent: Travels in Manchuria, 1884-94*, 1896; Sven Hedin, *Through Asia, 1899-1902, 1904-7*; D. Lattimore, *Desert Road to Turkestan*, 1928; M. Cahile and F. French, *The Gobi Desert*, 1944; and P. T. Etherton, *Across the Great Deserts, 1948*.

Gobineau, Joseph Arthur, comte de (1816-82), Fr. diplomatist and writer, b. at Ville d'Avray, Seine-et-Oise. Son of a retired officer. Worked for a time, first with a Paris gas company and then with the post office dept. Then wrote for Parisian journs, attracting the attention of de Tocqueville who, as foreign minister, made G. chief of his secretariat. From 1849 G. filled various posts in the diplomatic service in Berne, Persia, Greece, Brazil, and Sweden, but retired in 1876 embittered because none of the great prizes in the service had fallen to him. His fame rests on his writings. For years he was unread in his own country, while in Germany he was the subject of an ardent cult. He wrote a hist. of the Persians and an account of the tenets of Babism (see BAHĀ'Ī); also a long poem *Amadis* and some novels, including *Scaramouche* and *L'Abbaye de Typhaine*. Some of his best writing is to be found in his *Souvenirs de voyage* and *Nouvelles Asiatiques*, books of exotic short stories. Probably his masterpiece is *La Renaissance*, a series of dialogues in which the masters of the It. renaissance discuss art, letters, statesmanship, and life's lessons. But the work which gave him his chief vogue in Germany is his pseudo-scientific book extolling the Nordic races, entitled *The Inequality of Human Races* (1854, 1884). This won him the friendship of Wagner and Nietzsche and profoundly influenced both men. Through his literary descendants G. was one of the founders of the pan-Ger. school of the early twentieth century. His work, together with that of Lapouge and Houston Stewart Chamberlain, supplied the pseudo-scientific foundation for Hitler's 'Aryan paragraph' and persecution of the Jews as a non-Aryan race. In keeping with his theories was his best known novel, *Les Pleiades* (1874). See R. Dreyfus, *La Vie et les prophéties du comte de Gobineau*, 1905, and life by H. Streintz, 1928.

Gobio (Gk. *κοβύς*, small fish), generic name of certain teleostean fishes belonging to the Cyprinidae and commonly called gudgeon (q.v.).

Goblin (Fr. *gobelins*; Low. Lat. *cobalus*), friendly but mischievous and impish sprite; corresponding to the Ger. *Abold*, domestic fairy. It is also called hob-goblin, and is supposed to haunt dark corners, for which reason it is used to frighten children.

Gobo, Jap. name for *Arctium Lappa*, the burdock (q.v.).

Goby or Gobius (Gk. *κυπρίς*, small fish), family of carnivorous fish of the sub-order

Gobiodea, allied to the blenny. Sev. species are found on Brit. coasts, but most species inhabit brackish pools. Chief characteristic is the production of the ventral fins into a sucker-like disk, by means of which they attach themselves to rocks. *G. niger* and *G. ruthensparri* are common Brit. species. They are found in most tropical and temperate seas and in length vary from half an inch—in the case of one species in the Philippines, ranking as one of the smallest of all vertebrates—to three feet.

Goch, tn. of Germany, in the Rhineland, 8 m. S. of Cleves (Kleve). During the Middle Ages it was noted for its linen, and in recent times for manufs. of brushes, plush, cigars, and margarine. During the Allies' operations early in 1945 to reach the Rhine, particularly fierce resistance was encountered on the S. side of the Reichswald near G. The Kalkar-G. road was crossed on Feb. 16, although Ger. forces of the First Parachute Army continued to resist strongly in the G. sector. The tn. itself, severely damaged, fell to Scottish and Welsh troops on Feb. 21. Pop. about 11,000.

God, see DEISM.

Godalming, municipal bor. in the Guildford parl. div. of Surrey, England, on the r. b. of the Wey. The famous public school of Charterhouse, founded in 1611, was transferred from London to G. in 1872. The manufs. of the tn. include paper, hosiery, and leather. Eashing Bridges, 1½ m. from G.—really one bridge divided into two parts—over the Wey, date from the time of King John. The bridges and their approaches, with a sum for maintenance, were presented to the public by the Old Guildford Society in 1901. Pop. 10,000.

Godard, Benjamin Louis Paul (1849-1895), Fr. composer, b. in Paris. He studied at the Conservatoire, and shared with M. Théodore Dubois the prize of the Paris musical competition of 1878 with his dramatic cantata *Le Tasse*. He composed a number of popular songs, such as *Chanson de Florian*, *Ninon*, *Je ne veux pas d'autres choses*; four operas, *Pedro de Zalamea* (1884), *Jocelyn* (1888), *Dante* (1890), *La lirandière* (left unfinished); the *Symphonie légendaire*, and the *Symphonie gothique*, and a large quantity of piano and violin pieces and various orchestral works.

Godavari: 1. Dist. of India in the prov. of Madras. In 1907-8 it was transferred to Kistna dist., its present area being 5634 sq. m. It is watered by the G. R. and its trib., the Sabari, and across the N.E. portion of the dist. lies a range of the E. Ghats. The timber from the forests is of great value and graphite is mined. The cigars known as lunkas are manufactured from tobacco grown on the lankas or ls. of the R. G. Sugar, oil-seeds, and rice are also cultivated. The chief tn. is Cocanada, the old cap. being Rajahmundry. The main line of the E. Coast Railway traverses the dist., a branch running to Cocanada. Pop. 1,500,000. 2. Riv. rising 50 m. from the Indian Ocean, and flowing across the Deccan from the

W. to the E. Ghats, empties itself into the river of Bengal. Its total length is 900 m. It is regarded as a sacred riv. and the festival of Pushkaram takes place on its banks at Rajahmundry once in twelve years. There is a dam constructed by Sir Arthur Cotton at Dowlaish-weram, from which three main canals are drawn off. By this means the entire delta is utilised for perennial crops. In 1920 nearly a million ac. were irrigated by this system. Two further canals have also been made and there is a large reservoir at Lake Beale.

Godefroy, Frédéric Eugène (1826-97), Fr. literary historian, b. in Paris. He compiled the *Dictionnaire de l'ancienne langue française et tous ses dialectes du IX^e au XV^e siècle* (10 vols., 1880-1903), which involved a stupendous amount of laborious research and is a standard reference book. Another important work of his is a *Histoire de la littérature française depuis le XV^e siècle jusqu'à nos jours* (9 vols.), 1859-81.

Goderich, Viscount, see RIFTON, EARL OF.

Godesberg, tn. in the Rhineland, Germany, situated on the l. b. of the Rhine, opposite Konigswinter, 4 m. S. of Bonn. Its popularity as a summer resort is largely due to its hydropathic estab. and mineral springs, but it is also a pretty tn. with a picturesque castle in ruins. It was at G. that Neville Chamberlain, the Brit. Prime Minister, flew to visit Hitler during the latter's menacing agitation against Czechoslovakia. The visit was on Sept. 24, 1938, and six days later it was followed by the Munich Pact (q.v.). Pop. 20,000.

Godet, Frédéric (1812-1900), Swiss Protestant theologian, b. at Neuchâtel. In 1837 he left the state church and became one of the founders of the free evangelical church of Neuchâtel, and till 1877 was its theological prof. G. was a great scholar, and his commentaries are among the most noteworthy pub. during the last century. Besides his commentaries on the Gospels of St. John (2 vols., 1863-65; Eng. trans. 1877); St. Luke (2 vols., 1871; Eng. trans. 1875); the Epistle to the Romans (2 vols., 1879-80; Eng. trans. 1880); and Corinthians (2 vols., 1886-87; Eng. trans. 1896), he pub. *Etudes bibliques* (1873-74), *Introduction au Nouveau Testament* (1893), etc. His son, Philippe Ernest (1850-1922), was a poet and historian of literature.

Godetia, genus of plants sometimes included with the evening primrose, which it resembles, in the genus *Enothera*, of the order Onagraceae. There are now a score of species, indigenous to W. America. Popular in Britain as hardy annuals, which can be flowered outdoor from May to Nov. or in cool greenhouses at any time. Colours are mainly pinks to reds, and pinks to purples and white.

Godfather and Godmother, see SPONSORS.

Godfrey, Sir Dan (1868-1939). Eng. conductor, b. in London, son of Dan G., a military bandmaster and grandson of Charles G., bandmaster to the Coldstream Guards (1825-63). He was educated at

King's College School and in Germany. Studied music in London under Lazarus and Alfred Caldicott, and also military band orchestration under John Hartman. Toured S. Africa 1891 for the Standard Opera Company; musical adviser to Olympia Ltd., 1893; and appointed resident musical adviser and director of music at Bournemouth, 1894. The corporation of that tn. took over control of music in 1896 when 'Dan G.'s Band' was converted into the Bournemouth Municipal Orchestra, the first of its kind estab. in England. Through G. thousands of people received their first introduction to classical music. By the long and consistent support given to native composers he did much towards building up the modern renaissance of music in England. His services to Brit. music were rewarded with a knighthood in 1922. On his retirement in 1934 he had conducted some 2000 symphony concerts. Pub. his *Memories and Music* (1924).

Godfrey of Bouillon (c. 1060-1100), leader of the first crusade, the second son of Eustace II., count of Boulogne. He was b. at Balz in Belgian Brabant, and served in the train of the Emperor Henry IV. He fought with conspicuous gallantry at the siege of Rome (1084) and was rewarded with the duchy of Lower Lorraine. In 1096, with his brothers Eustace and Baldwin, he rode to Constantinople and paid homage to Alexius in 1097. Two years later he led the march to Jerusalem, and was elected its ruler on July 22. In Aug. of the same year he defeated the sultan of Egypt on the plain of Axalon, and after a year spent in organising his d. See De Hody, *Godefroid de Bouillon*, 1839, and Frobose, *Gottfrid von Bouillon*, 1879.

Godhra, tn. of Bombay, India, in the dist. of Panch Mahals, 50 m. N.E. of Baroda. The prin. trade is timber, obtained from the surrounding jungle. Pop. 27,000.

Goding, tn. of Czechoslovakia in Moravia, situated on the R. March, 22 m. N.E. of Nikolsburg. Formerly an Austrian tn. There is a royal castle. The prin. manuf. are glass, sugar, and tobacco. Pop. 12,000.

Godiva, Lady, wife of Leofric, earl of Mercia and lord of Coventry. According to legendary hist. she released the townsfolk of Coventry from the heavy taxation imposed by her husband by riding through the tn. clothed only in her long hair. In St. Michael's Church there is a stained-glass window commemorating her magnanimous action, and in a niche is an effigy of Peeping Tom, who was said to have been struck blind as he peeped at her behind his shutters. The G. procession which was included in Coventry fair from May 1678 ceased in 1826.

Godless Five Year Plan, see FIVE YEAR PLAN.

Godmanchester (anc. *Darulipons*), municipal bor. and mrkt. tn. of Huntingdonshire, England, on the Ouse, 1 m. S.E. of Huntingdon. An anc. tn. with an agric. trade and flour mills. Noted for its milk cheeses. Pop. 2000.

Godolphin, Sidney Godolphin, earl of (1645–1712), Eng. politician, b. at G. Hall, near Helston, Cornwall. He became attached to the court as a page in 1664, being promoted to a groom of the bed-chamber in 1672. He accompanied Sir W. G. on an embassy to Spain (1668) and in 1678 was sent as envoy-extraordinary to the Netherlands to negotiate between the prince of Orange and the duke of York. In the following year he sat among the Commons and was appointed a commissioner of the Treasury. He became first commissioner in 1684, when he was raised to the peerage. On the accession of James II., was appointed chamberlain to the queen, but he returned to the Treasury in 1686, and supported his sovereign at the revolution. William III., however, retained him in office until



SIDNEY, EARL OF GODOLPHIN

1696, when with other Tories he was obliged to retire before the Whig party. In 1700 he was once more reinstated, and on the accession of Anne in 1702 became lord high treasurer, an office which he held till 1710, when Anne, under the influence of Harley and Mrs. Masham, began to view him with disfavour. He and Marlborough effected the dismissal of Harley, but a few months later G. was himself summarily dismissed by the queen. He d. at Marlborough's seat, Holwell House, near St. Albans. He was a wise and cautious administrator, and by his masterly control over the finances did much to secure the success of Marlborough's famous continental campaigns. See the life by the Hon. Hugh Elliot, 1888.

Godowsky, Leopold (1870–1939). Polish composer and pianist, b. at Vilna. Studied piano-forte in Vilna, and at the age of nine appeared in public. After a tour of Russia and Poland studied from 1881 to 1884 under Ernst Rudorff in Berlin. Studied under Saint-Saëns, 1887–1890. From 1890 to 1900 teacher and concert pianist in U.S.A.; then for many years in Berlin, and in 1909 director of Klaviermeisterschule, Vienna. Works: studies in Chopin's *Etudes* (1904); Sym-

phonie Metamorphoses of Themes of Johann Strauss, *Walzermasken*, etc.

Godoy y Alcayaga, Lucila, see MISTRAL, GABRIELA.

Godoy y Alvarez de Faria, Manuel de, Duke of Alcudia (1767–1851), Sp. statesman, b. at Badajoz. While serving in the royal guards he became the favourite of Maria Luisa, wife of the future king, Charles IV., and after that prince came to the throne G. rapidly attained influence and position, being made duke of Alcudia in 1791 and, from 1792 to 1797, minister of state. He played a conspicuous part in the affairs of Spain during the Fr. Revolution and the Empire. He declared war on France (1792–95) but was defeated and negotiated the treaty of Basel (1795), for which he was granted the title of 'Prince of the Peace,' though the treaty was concluded in opposition to the general wish of the Sp. people. Restored to power again in 1801, he was compelled by Napoleon to lead Spain in an attack on Portugal; he aided France in the war with England (1801–5), but incurred great unpopularity on account of his arbitrary conduct and, above all, for the defeat of the Sp. fleet at Trafalgar. He was then imprisoned by the king and was forced to flee from Spain in 1808, being helped to escape by Napoleon. Lived in Rome and Madrid (1808–51). His *Mémoirs* (pub. in Eng.) were pub. in 1836. See T. Hardy, *The Dynasts* (Part II.), 1906.

'**God Save the King**' (or Queen), Eng. national anthem, of uncertain origin and authorship, first performed in 1740, to celebrate the capture of Porto Bello, S. America, by Vernon. It is usually attributed to Henry Carey (1696–1743), or to John Bull (1633–1628), who wrote an 'ayre' very similar to the present tune, which is in two sections of six bars and eight bars. The tune was adopted in France in 1776, and has been used as the Dan., Prussian, and Ger. national air. Beethoven introduced it into his *Battle Symphony*, and Weber used it also. The Amer. national air *My Country, 'tis of thee* (written by Dr. Smith, 1843), is sung to the same same tune, as is the Swiss *Ruise Du, mein Vaterland*. In Germany it is sung to *Heil dir im Siegerkranz!* The old Lat. hymn, *O Deus Optime* (probably written about 1688), was set to Bull's 'ayre,' and had words very similar to the present Eng. version. It is sung on all ceremonial occasions throughout the Brit. Empire. Words and music first appeared in *Harmonia Anglicana* (1742) and in the *Gentleman's Magazine* (1745). See Clarke, *Account of the National Anthem*, 1822; W. Chappell, *Collection of National Airs*, 1838–40; and W. H. Cummings, *God Save the King*, 1902.

Godstone, rural par. in Surrey between Reigate and Caterham. Pop. 24,000.

God's True name given to means of promoting peace devised by the Church, when, after the fall of Charlemagne's empire, the right of private war and vengeance (as practised by early Teutonic races) threatened to become a source of anarchy instead of a rough and ready form of justice, in the ninth and tenth centuries.

There was a mutual agreement on the part of the barons and nobles of certain dists. to abstain from war between fixed days, and respect the rights of all following purely peaceful callings, such as priests, travellers, or tillers of the soil. Originating in S. France at the synod of Tuluges in Roussillon, 1027, the custom spread to Germany, Italy, Spain, and England. The chief stipulations were: (1) the keeping of peace from Wednesday evening to Monday morning; (2) during Advent and Lent; and (3) on the prln. saints' days and holy days. Breaking of the *treuga Dei* was punishable by fines, banishment, and excommunication. The council of Clermont confirmed the truce (1095) under Urban II. The Emperor Henry III. (1017-56) adopted it as imperial law. It fell into disuse in the thirteenth century. See E. Semichon, *La Paix et la trêve de Dieu* (2nd ed.), 1869.

Godunov, or Gudunoff, Boris, see BORIS, FEDOROVICH GODUNOV.

Godwin, or Godwine (c. 990-1053), earl of the W. Saxons, or Wessex, a great Eng. noble, one of Canute's most powerful supporters by 1020. He helped to place Edward the Confessor on the throne of England (1042), and headed the national party against the Norman favourites. His daughter Edith married the king, and his son Harold was the last native Eng. king (killed at Hastings, 1066). The Norman party grew powerful, and G.'s influence waned, partly owing to the crimes of his son, Sweyn. Outlawed in 1051 he fled to Flanders, but returned next year and was welcomed by the people, forcing Edward to restore him to his old position. See A. E. Freeman, *The Norman Conquest*, I. and II., 1870-79; J. Green, *The Conquest of England*, 1883; and Saxo, *Historia Danica* (ed. 1644).

Godwin, Francis (1562-1633), son of the bishop of Bath and Wells, b. in Northamptonshire. He graduated at Oxford in 1580, and then took orders, being made sub-dean of Exeter in 1587, and bishop of Llandaff four years later. He is chiefly remembered by his fanciful story, *The Man in the Moon*, which undoubtedly had an influence on Swift's *Gulliver's Travels*. Cyrano de Bergerac imitated and trans. G.'s work into Fr. G. also wrote *Rerum Anglicarum Annales*, 1616.

Godwin, Mary Wollstonecraft (1759-97), Eng. writer of Irish descent and pioneer of the Women's Rights movement. She had to earn her living by teaching (1778-88), and then worked for Johnson, the publisher, as reader and translator. While thus engaged she met Paine, Priestley, and Fuseli. Going to Paris she collected materials for her never-finished *Historical and Moral View of the French Revolution* (1794), and there met Capt. Imlay, who soon deserted her. She married Wm. G. in 1797, dying at the birth of their daughter (see SHIRLEY, MARY WOLLSTONECRAFT). In 1811 her remains and those of her husband were removed from Old St. Pancras churchyard to Bournemouth. A portrait of Mary Wollstonecraft, by Opie, is in the National Portrait Gallery. Mrs. Opie's *Adeline*

Mowbray (1804) was founded on the outlines of Mary's life. Her works include *Thoughts on the Education of Daughters* (1787); *Original Stories from Real Life* (1788); *Answer to Burke's Reflections on the French Revolution*; *Original Stories for Children* (1791); *Vindication of the Rights of Women* (1792); *Posthumous Works*, 1798, including 'The Wrongs of Women, or Maria, a Fragment' and 'Letters to Imlay' (new ed. with memoir by G. Paul, 1870). See memoirs by Wm. Godwin, 1798; E. Pennell, 1885 (*Eminent Women* series); E. Rauschenbusch-Clough, 1888; *A Defense of the Character and Conduct of the late M. W. Godwin* (anon.), 1803; and M. Linford, *Mary Wollstonecraft*, 1924.



WILLIAM GODWIN

Godwin, William (1756-1836), Eng. novelist and miscellaneous writer. He was a dissenting minister, preaching at Ware and Stowmarket in 1777-82. His faith being shaken by the study of Fr. philosophers, he gave himself up to a literary career. He wrote *Life of Chatham* (1783) and *Sketches of History in Six Sermons* (1784), but his first important work was *Enquiry Concerning Political Justice* (1793). In this he revealed himself as a sympathiser with the Fr. Revolution, and representative of Eng. Radicalism. G. taught that government is not an end in itself and that man's true growth is towards emancipation from it. He perceived the evil of collectivism. He relied upon and defended the integrity of the human personality. Agnostic, he attacked organised religion, rejected the hope of immortality, and regarded Christianity as harmful because it diverted men's thought from their potentialities in the world to their expectations of another. He married Mary Wollstonecraft in 1797, though both disregarded the importance of a legal tie except for the sake of the children. G.'s views, however,

became modified in later life. He knew many celebrated people of the day, such as Jane Southey, Coleridge, Lamb and Shelley (who married his daughter Mary, 1816). His works include *The Adventures of Caleb Williams* (1794), *Sir Teon* (1799), *Tables* (1805) and other children's stories under the name J. Baldwin. *Mundeville* (1817), *History of the Commonwealth of England* (1821-25) and *Thoughts on Man* (1831). See W. Hazlitt *The Spirit of the Age* (1822); Sir I. Stephen *English Thought in the 18th Century* 1876 and *Hours in a Library* 1882; C. Kegan Paul *William Godwin*, his Friends and Contemporaries 1876; H. Louisa Williams *Godwin* 1913; J. K. Brown *Life of Godwin* 1826; and C. Woodcock, *Willis's Godwin* 1916.

Godwin-Austen, Henry Haversham (1831-1923) Eng surveyor. He joined the army in 1851 doing survey work in India after 1857 making many remarkable ascents in the Himalayas. In 1862 he ascended Mount Kangchenjunga (28,200 ft.) and Mount Everest in Nepal (29,002 ft.). He was named after him 1888. He descended on many glaciers including the Tiditzi near by. His works include *On Land and Fresh Water Mists and Clouds* (1882-93) and *The Jungles of British India* (with Dr. Blandford) (1908).

Godwit, or *Limosa* genus of wading birds of the snipe family (Scolopacidae) much resembling sandpipers. They have very long bills slightly upcurved, long slender legs with a great part of the tibia bare of feathers and the claw of the third toe comb-like. Five species of this genus *Limosa* are known, all frequenters of marshes, especially by the seashore. They inhabit the Arctic and temperate regions of the N. hemisphere chiefly but migrate southwards in the summer as far as N. Africa, S. America and even New Zealand. As birds of passage the black-tailed G. (*L. belga*) and the bar-tailed G. (*L. lapponica*) are found in Britain. The former at one time used to breed in E. England. The females are larger than the males. Other species are the marbled and the Hudsonian G. (*L. fedoa* and *L. haematocephala*), or 'marlin' G.s are valued as a table delicacy, and sent from Holland to London.

Goebbels, Paul Joseph (1897-1945) Ger. politician. Born at Rheydt, Rhineland of peasant stock, he succeeded through scholarships and hard work in providing himself with a first rate education and studied at seven univs., graduating Ph.D. at Heidelberg in 1920. Was for some time a struggling journalist and an equally unsuccessful dramatist whilst the latter fact may explain his bitterness towards the Jews for where plays by Jewish dramatists were accepted his were rejected. In 1922 he became a most efficient propagandist of National Socialism and in 1926, after successful campaigns in the Rhineland and the Ruhr, he was made party leader, or *Gauleiter* for Berlin. In 1927 he founded the Berlin daily paper

Der Angriff which he ed. His newspaper was as ruthless and as active as his shock troops. Its campaigns employed any lie or distortion of facts to suit the purpose of the moment. Libel actions failed to suppress either the pub. or its editor. In 1928 he was elected to the Reichstag and in the following year he was made chief of party propaganda and in 1933, minister of propaganda and popular enlightenment in Hitler's govt. Zealous as any fanatic it was he who canonised Horst Wessel and other Nazi 'heroes and martyrs'. In his capacity of minister of propaganda his



JOSEPH GOEBBELS

cynical ingenuity matched his entire want of moral scruple. The press, literature, the cinema, theatre, music, and every other cultural field came under his control and each and all were subordinated to the task of popularising Nazi policies and expelling away the deficiencies of its rule. Germany probably owed her initial political successes in the 'war of nerves' as much to his propagandist machine as to any other agency. Later he held the rank of *Reichsleiter* in the party and was made president of the *Reichskulturkammer*. Married the divorced wife of a wealthy Jew named Friedländer, to whom her former husband was forced by the Nazis to leave 600,000 marks, by the aid of which he acquired as residence the castle of Schwanenwerder. An unhappy perverted man leading a notoriously dissolute life, he yet often posed for pictures designed to show him as a family man.

leading power in the Nazi hierarchy, he realised, in the last days of the Russian siege of Berlin, that he would eventually be tried as a war criminal, and chose to escape his inevitable doom by taking his own life and those of all his family. See L. Lochner (ed.), *The Goebbel Diaries*, 1948; and life by C. Rees, 1949.

Goeben, August Karl von (1816-80). Prussian general, b. at Stade, Hanover; son of Maj. Wilhelm von G. Became lieutenant of infantry. In Carlist adventure in Spain, 1835-40. In 1860 under O'Donnell in Morocco. In Prussian wars against Denmark (1864) and Austria (1866). In Franco-Prussian war commanded 8th Army Corps; at Saarbrücken, Gravelotte, and Metz; commanded N. of France campaign that ended in victory of St. Quentin, Jan. 19, 1871. He commanded 8th Army Corps at Koblenz till his death there, Nov. 13.

'Goeben' and 'Breslau.' The. These two ships, which during the earlier part of the First World War eluded the vigilance of the Brit. Navy and got into Turkish waters, were nominally bought from the Ger. Gov. by Turkey as 'compensation' for the action of the Brit. Gov. in taking over three other ships which at the time were being built in Eng. shipyards to the order of the Turkish Gov. As a fact, Ger. crews remained in charge of the ships. There is no doubt that their acquisition by Turkey was so material an accession to that country's feeble naval strength that it was one of the factors which decided the Porte to enter the conflict at that particular time. The Turkish Gov. had ordered three warships to be built, *Ressadiye*, *Sultan Osmanli*, and *Fethé*. Whatever the cost, Turkey was resolved to have fleet superior to that of Greece, and the Turkish people were united in a common sentiment of revenge. But on the outbreak of the First World War, and while Turkey was still neutral, the Brit. Gov., exercising the well-established right of pre-emption, took over the Turkish ships. The *G.* and *B.* were then in the Mediterranean, and, escaping the Brit. squadron under Adm. Troubridge, came out of their refuge at Messina on Aug. 7, 1915, and afterwards made a dramatic reappearance before Constantinople on Aug. 11. The plot was a clever one. Germany 'generously' offered her two ships to Turkey by way of compensation for England's 'theft.' The Brit. Gov. contended that legally the two battleships should be dismantled and the crews interned. Eventually the Brit. Gov. agreed to the Porte's wishes that the crews should remain on board until the Turkish crews, which had come to England to sail the ships in commission to Turkey, should have returned. But when these crews did reach Turkey it was too late, for the *G.*, abetted by Enver Bey, had carried through their intrigue, with the result that Adm. Limpricht and his Brit. officers had to leave the ships and Turkish officers came aboard. The Brit. Admiralty held an exhaustive inquiry on the escape of the two ships, with the result that Rear-Adm. Troubridge applied for trial by court

martial. The finding of the court martial was an honourable acquittal for Troubridge. The *G.* was a 28-knot boat, as against the 20-knot speed of Troubridge's armoured cruisers, and her guns had a range of 18,000 yds, as against 14,000-15,000. Hence the *G.* could have steamed round Troubridge's squadron and sunk each boat in detail. After the war the *G.* was renamed *Yavuz*, mounting ten 11-in. guns and four torpedo tubes.

Goedeke, Karl (1814-87), Ger. literary historian, b. at Celle. He was educated at Gottingen, and eventually became prof. of hist. there. His prin. work is *Grundriss der Geschichte der deutschen Dichtung (1859-1929)*, and his biography of Goethe is also well known. He was a remarkably prolific author, and wrote sev. novels and a drama entitled *König Kotrus, eine Missgeburt der Zeit* (1839), besides much critical and biographical literature. Besides those mentioned, his publs. include *Deutschlands Dichter von 1813 bis 1843* (1844); *Kl. Bücher deutscher Dichtung von Sebastian Brant bis auf die Gegenwart* (1849); and *Deutsche Dichtung im Mittelalter* (1852-54).

Goeje, Michael Jan de (1836-1900), Dutch Arabic scholar; educated at Leyden under Dozy. In 1866 he was appointed to the chair of Arabic at Leyden. He issued an ed. of *Tabari* (1879-92), and wrote vols. iii.-v. of *Catalogus codicum orientalium bibliothecæ Lejduno-Batavae* (1865-73). Among his other works are *Mémoires d'histoire et de la géographie orientale* (1862-1866); *Edrisi's Description de l'Afrique et de l'Espagne* (with Dozy) (1866); *Liber expugnationis regionum, aurore al-Beldsori* (1866); *Fragmenta historicorum Arabiorum* (1869-71); *Bibliotheca geographorum Arabicorum* (1870-92); *Diccionario Morisco ibn-al-Wald* (1875); and *Selections from the Annals of Tabar* (Semitic Library) (1902). He also wrote for the *Ency. Brit.*

Goering, Hermann Wilhelm (1893-1946), Ger. field marshal and politician, b. at Rosenheim, Bavaria. In the First World War he was successively pilot, squadron-leader, and finally commander of the famous Richthofen 'air circus.' After the war, which he left as a captain, he served in civil aviation in Sweden, married his first wife, a wealthy Swedish woman, Karin von Fock, and was engaged in the aero-engine industry in Germany. He led a drifting life at this time, turning his back on the new democratic Germany. In 1922 became an active supporter of the new National Socialist party. Took part in Hitler's abortive Munich *putsch* in 1923 and, again, after the collapse of Hitler's party, became an exiled drifter. Took to drugs and was certified as a morphine addict, spending some time in a mental hospital in Sweden. In 1926 he returned to Germany, where Hitler's party was beginning to gain influence. In return for the promise of large contracts he secured the support of important industrial concerns and, by plotting and intrigue, became, in 1928, one of the Nazi party's representatives in the Reichstag, and, in 1933, after Hitler's coup, Prime Minister

of Prussia and minister of the interior. In this latter capacity he reorganised the police and the internal administration in accordance with Nazi ideas. He is thought to have played a part in the staging of the Reichstag fire of Feb. 1933. In 1934 he was Prime Minister of the Reich and promoted to the rank of general, and in the meanwhile had made himself minister of aviation. It was now that he began secretly to lay the foundations of Ger. air power. He started the Air Sports League, outwardly one of the youth organisations that were so popular in Germany, but in 1935 the members of the league were being supplied with uniforms. He then turned to economics and was appointed commissioner of the 'four-year plan,' gradually ousting Dr. Hjalmar Schacht, representative of conservative business interests, and became virtual economic dictator of Germany. In 1938 he received the rank of field marshal. Was Hitler's right-hand man in expropriating the Jews in that year. Co-operated with Hitler in finally extinguishing all 'left' tendencies in the Nazi movement, and, indeed, was designated as Hitler's successor in the event of the latter's death.

In 1937 he became Reich minister for foreign affairs. The documents in the Nuremberg trial reveal the prominent part he took at this time in securing, through the puppet Ger. chancellor in Austria, Seyss-Inquart, the ruin of the Schuschnigg Gov. in Vienna in the interests of the 'freedom' of the Austrian people. The share he had in preparing a despotistic war of aggression is established beyond all doubt by these documents. Among them were the minutes of a conference of Oct. 14, 1938, a fortnight after the Munich Pact was signed, between G. and his economic planning staff. They show the extraordinary economic situation in which G. then found himself, and the long black shadow this situation was casting ahead at a time when, on the basis of the pact, all should have been concord. From the evidence in the trial it was proved that G. was at great pains to justify the seizure of Czechoslovakia, especially as Mussolini was by no means enthusiastic over the move. Yet G. could adduce no better reason than the desire to eliminate the Czechoslovak forces: 'The heavy armament of Czechoslovakia,' he said at a conference on April 15, 1939, with Mussolini, 'shows in any case how dangerous that country could have been, even after Munich, in the event of a serious conflict. Because of Germany's action the situation of both Axis (q.v.) countries was ameliorated, among other reasons because of the great armament potential of Czechoslovakia. This contributes towards a considerable strengthening of the Axis against the western powers, and much else to the like purport, all providing its own commentary on Ger. aggressive intentions behind the facade of Munich.' G. gambled even on the *Luftwaffe*, which was by no means so strong as to justify universal aggression; the document 'Case Green' was his directive: 'By means of simulated activities on as many peacetime aero-

dromes as possible, and on other aerodromes known to the enemy, further by installing new dummy aerodromes, and by distributing our own forces in small units over a wide area, we intend to create a deceptive impression of great fighting strength and so split up the enemy's combat forces.' Thus there was always an 'enemy' even in days when no war clouds should have threatened the peace of Europe. In his defence at Nuremberg G. concluded his examination-in-chief with words which he impudently attributed to Mr. Churchill: 'In a struggle for life and death there is no legality,' words which aptly sum up the man G. and everything he stood for, as seen in an address that lasted for twelve hours and in which all his powers of persuasion were concentrated on maintaining that, given the inevitability of war, any measure was justified in the last resort so long as it redounded to the greatness of the Ger. Reich. That it was precisely this attitude which plunged the world into war had little place in his argument, apart from his redoubled efforts to prove that the Soviet preparations were really responsible for it all.

G. also had a hand in the cold-blooded shooting of nearly fifty officers of the R.A.F. after their mass escape from Stalag Luft III, but he pretended that he had protested to Hitler about it. On the crime of bombing Warsaw, Rotterdam, and Coventry, all ordered by him, he said that Warsaw had refused to surrender and that civilians were resisting in defiance of the rules of international law and that, as to Rotterdam, 'it was in everybody's interest to get the campaign over quickly'; and it was always on this cynical note that G. concluded his amazing arguments. In cross-examination he was challenged over the murder of 4,000,000 persons at Auschwitz (q.v.) concentration camp (q.v.) alone, but whatever he said to establish his 'ignorance' the captured documents showed that, like all the Nazi leaders, he probably knew what was going on in the camps. He was sentenced to death at Nuremberg but had somehow, despite the vigilance of his guards, succeeded in secreting poison (not improbably through his wife) and took his own life rather than face the hangman. In 1935 G. married Frau Emma Sonnemann, a leading Ger. actress, his first wife having d. in 1931. He acquired a sumptuous country seat, which he named Karinhall after his first wife. It was G. who coined the slogan 'Guns for butter' to induce the Ger. people to restrict consumption in order to promote rearmament. G. was interested financially in some of the leading industrial concerns of Germany and would seem to have been extremely wealthy. At Berchtesgaden (q.v.) was found a modest rustic building containing his art loot—jewels, pictures, ceramics, and statuary relics, of which the lowest valuation was £20,000,000.

Goes, Bento de (1562-1607), Jesuit missionary of Portuguese birth, b. in the Azores. In 1603 he was sent on a mission to the Great Mogul, and thence to Cathay.

On his travels he acquired an extensive knowledge of the geography of Asia, ascertaining that Cathay and China were one and the same place. *The Travels of B. de Goes from Lahor to China* is the name of Eng. version of his writings.

Goes, Hugo van der (1420-82), Flemish painter, b. at Ghent. He became known by his picture, 'The Meeting of David and Abigail,' which attracted a good deal of attention. Van Eyck instructed him in the rudiments of oil painting. See J. Destréo, *H. van der Goes*, 1914, and Sir M. Conway, *The Van Eycks and their Followers*, 1921.

Goes, fortified tn. of Holland in Zealand, on the is. of S. Beveland. There is a Gothic church (1423) and picturesque tn. hall, restored in 1771. It is the centre of the linen industry; others are brewing, bookbinding, boatbuilding, and the manuf. of cigars. It has a good harbour. Pop. 8000.

Goethals, George Washington (1858-1928), Amer. major-general and engineer, b. at Brooklyn. Taught for a while at West Point; worked at riv. improvements, neighbourhood of Pittsburg; then, as major in regular army, took charge of fortifications at Newport, Rhode I. Joined the general staff at Washington. In 1907 appointed chief of new organisation of work on Panama Canal, with supreme civil and military power. After opening of canal, May 1914, first civil governor of Canal Zone—resigned 1916 having become major-general 1915. Late in 1917 acting quartermaster-general. In 1918 chief of div. of purchase, storage, and traffic; member of War Industries Board. Retired from service, 1919.

Goethe, Johann Wolfgang von (1749-1832), Ger. poet, dramatist, and philosopher, who 'placed his nation at the head of the intellectual movement of the century' (Scherer). G. was b. at Frankfort-on-Main, of an affectionate and joyous mother, who was her son's first playmate and teacher, transmitting to him her love of story-telling and her mirthful disposition, and of a cold, stern, rather pedantic father, whose uprightness and stability of character must have entered in some degree into his son's composition, since G., 'often erring' as he tells us, always 'found himself' again. The G. family belonged to the well-to-do burgher class, and the poet's whole life was spent in conditions of prosperity and comfort, a circumstance which his detractors use to belittle him, and his admirers (Carlyle, Lewes, and others) to add to his glory, in that he maintained throughout life a high degree of simplicity, even austerity, in material things. In 1765 he entered Leipzig Univ. as a law student. Here he spent three restless years, distinguishing himself, on the one hand, for unusual wisdom and on the other for recklessness, extravagance in thought and behaviour, for waywardness and melancholy, alternating with high spirits. He filled his days with pleasure and some study, came under the influence of the Fr. dramatists at the theatre, began his life-long habit of falling in love, and returned home in

broken health to an angry father with two comedies of his own composition, *Die Laune des Verliebten* (which may be styled 'Lovers Quarrels') and *Die Mitschuldigen* ('The Fellow Sinners') (only pub. in 1787). Next he studied at Strasburg for about two years, where he formed a friendship with Herder, who roused in him an overwhelming enthusiasm for Shakespeare and for the old Ger. epics. The result of this was that G. soon became one of the foremost leaders in the *Sturm und Drang* ('Storm and Stress') movement, which expressed the reaction against the tyranny of classical and Fr. influence on thought



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JOHANN WOLFGANG VON GOETHE
From the painting by George Dawe, 1819

and literature, and the wish to put away all that was artificial, to return to 'nature' and 'reality.' Lessing had preached this, and the young Romantic school practised it, even to outrageousness at times. G.'s two dramas, *Gotz von Berlichingen* and *Die Leiden des jungen Werthers*, are the direct outcome of this movement. The former was written soon after G. left Strasburg, though not pub. until 1773; *Werther* was pub. in 1774. At Strasburg the poet studied art, gained his degree of *doctor juris*, and wrote some of his most beautiful lyrics under the inspiration of Frederika Brion. His life at Wetzlar in 1772, in close friendship with Kestner and his betrothed, Charlotte Buff (Lotte), with whom G. fell in love, creating a situation honourably sustained by all three friends, gave him the inspiration for *Werther*. The romance embodies the actual facts of this experience up to a certain point only, though the description of its effect on Werther's (G.'s) temperament is true to life. The book caused a tremendous sensation, abroad as well as in Germany.

Carlyle calls it 'the voice of the World's Despair.' G., in whose writings 'the moral lesson is seldom so easily as one could wish' takes, as it were, a text in this case and heads his work with the motto, 'Be a man and follow him not.' G. was now living in Frankfort, and here his acquaintance was sought by the most notable men of the day in Germany, among others Klopstock, Lavater, Base-dow, Jacobi, and the Stolbergs. *Clavigo, Stella* (an extravagant comedy for lovers, which suggested to Canning the parody of *The Rovers* or *The Double Arrangement*), *Prometheus*, *Der ewige Jude* (The Wandering Jew) (of which very little remains extant), and *Mahomet* were produced; *Faust* was begun, and immortal lyrics (such as *Neue Liebe neues Leben, Heidenroslein, Herz mein Herz was soll das geben*) addressed to Frhllein Schoneemann (Lilli).

In 1775 G. accepted an invitation from Duke Karl August to his court at Weimar. The strong attachment which already existed between the two men was deepened by further intercourse, and Weimar was henceforth the poet's home. He took part in public life, was created *Geheimrat* (Privy Councillor), then president of the Chamber of Finance, and was ennobled in 1782. His intellectual activities were stimulated by the duke and his wife, the Duchess Luise, and a circle of brilliant friends, including Herder, Muysius, Knebel, Wieland, and Schiller. His love for the Frau Charlotte von Stein, which lasted ten years and inspired further lyrics, dates from 1776. She was a noble-hearted woman, a lady of the court, wife of the master of the horse, and thirty-three years of age, with seven children. G.'s letters to her extend over a period of nearly fifty years. A note in G.'s diary shows that he decided at Weimar to have done with the lawlessness of youth and to start on a course of self-culture; he says that he had, to use Browning's words, 'Somewhat to cast off, somewhat to become,' or as he himself expressed it later, he resolved to cease doing things by halves and to work out life in its totality, beauty, and goodness. 'Vom Halben zu entwöhnen, und im Ganzen, Guten, Schönen, resolut zu leben.' The first sketches for *Iphigenia*, *Tasso*, *Eymond*, and *Wilhelm Meister* were made; *Faust* was continued, and lyrics produced. In 1786 he escaped from the work and festivities of Weimar and went to Italy, where he spent a year and a half, mostly in Rome and Naples. Here he worked at his poems and plays, studied and practised art (Tischbein and Angelika Kaufmann were among his friends), and pursued investigations in science.

This was a period of great development for G., indeed it changed his intellectual standpoint. He outgrew the *Stern und Drang* phase and worked towards the Gk. ideal of calm and harmony, recasting and publishing (1786) under this new influence *Iphigenia*, in which the rules of classical poetry, cast aside with jubilant satisfaction in his earlier writings, were closely observed. His matchless *Römische Elegien* (1788) onshrine side by side this new spirit and his love for Christiane Vulpius,

who became his wife in 1806. *Tasso* (1790) reflects the conflicts in the author's own mind caused by the various influences he had encountered in his life up to then. In 1794 G. and Schiller, who hitherto had been but mere acquaintances and, in some degree, rivals, entered upon a close and noble friendship which lasted until Schiller's death. Schiller constantly aroused G.'s enthusiasm, and G.'s influence made Schiller a clearer thinker. The two poets started a magazine, *Die Hörer*, to try to raise the standard of taste in art and literature; it failed, and the epigrams, called the *Xenien*, the joint work of the two friends, were 'fired off' in revenge against the magazine's enemies. The pub., in 1796, of *Wilhelm Meister's Lehrjahre* (or Apprenticeship) estab. G.'s fame for ever. In this rambling and discursive romance in eight books, G. develops his philosophy of the conduct of life in describing the career of a young Ger. artist at the beginning of the nineteenth century. In the course of the work the weak-willed, dreamy, self-indulgent hero attains power of self-control and a sense of duty. But, as is usual in G.'s writings, there is no direct moral teaching; the work is a picture of 'rich, manifold life brought close to our eyes,' and the picture, being true to life, reflects the laxity of morals in the Germany of the time, and it is drawn without that comment which alone would have satisfied hostile critics. One of the many varied scenes in the vol. is the unforgettable poetic and touching incident of Mignon and the Harper, which has deservedly become universally famous. The valuable criticism on *Hamlet* is also to be found in *Wilhelm Meister*. *Hermann und Dorothea* (1798), written in a spirit of patriotism, is a poem of simple beauty and idyllic charm, with a background of troublous times, the fruits of the Fr. Revolution, towards which G. felt no sympathy. In it the human and tender side of the poet's genius is seen at its best; it is his masterpiece in this kind. G.'s greatest work, *Faust*, occupied him in the intervals of other work for upwards of fifty years: it has been well called 'the companion of his literary life,' and was first pub. as a whole in 1831. It reflects the evolution of the thoughts and character of the man G. from youth to age, and is therefore of unique biographical interest. *Faust*, like G., struggles for perfection, often yields to evil but never comes to love it or to lose his belief in the right and good. His failure in his quest for absolute knowledge leads him to despair, from which he is rescued only by a life of useful labour. This outcome leads us straight to the keynote of the Goethean philosophy - renunciation and resignation, and to the poet's conviction that 'He only earns his freedom and existence, Who daily conquers them anew' (Bayard Taylor's trans.), in *Faust*'s dying words: 'Nur der verdi 't sich Freiheit wie das Leben,
Der taglich sie erobern muss.'

The two parts of *Faust* are as dissimilar as the influences under which they were

written. Part I. being 'romantic' and Part II. 'classical' in form and spirit. The involved symbolism of Part II. is very difficult to comprehend. Both parts rise to the loftiest heights of poetry and art. G.'s achievements in science, optics, botany, anatomy, and mathematics include some useful discoveries and many misconceptions; his discovery of an intermaxillary bone in man was important. His prin. scientific treatises are *Metamorphoses of Plants* and *Farbenlehre*, (Theory of Colour). Many less known works have not been mentioned above. Among them may be mentioned *Die Wahlverwandtschaften* (1809), a story which is sometimes regarded as showing the immoral tendency in G.'s works. In it a married couple are thrown into the constant companionship of two unmarried persons and a cross-attraction ensues like that which is often observed in chemical experiments. The psychological changes by which this result is effected are depicted with great skill. The three ballads, *Der wandelnde Glocke*, *Der Getreue*, and *Der Todtentanz* (1813), written during the height of Napoleon's power, but not impassioned like the songs of Korner nor inspired like the orations of Fichte, for G. had, evidently, little sympathy with the rise of the Ger. people against the dictator. *Westostlicher Diwan* (1814) was an attempt to introduce oriental poetry into Germany, an example which was followed by Heine. In 1797 G. wrote *Die Braut von Korinth*, *Gott und die Bayadère*, *Der Zauberlehring*—all being pub. in the *Musen Almanach* for 1798—which have affinities with the contemporary works of Schiller. At this time too G. trans. much of the autobiography of Benvenuto Cellini and wrote a number of essays on aesthetics. G.'s life and character are best studied in his works, nearly every one of which presents some aspect of the man as he was when he wrote it. As Carlyle says: 'In Goethe's works . . . we see . . . a mind working itself into clearer and clearer freedom, gaining more and more perfect dominion of its world.' His formal autobiography *Dichtung und Wahrheit* (1811–22), the work of his old age, is inaccurate, not in fact alone, but more seriously, in what Lowes calls 'tone.'

G.'s b.p.—the eighteenth-century dwelling which stood in the Hirschgraben in Frankfurt until its destruction in an air raid in March 1944 (1949) being rebuilt from the stones and rubble. The architects, using many old prints, drawings, and photographs have succeeded in planning the design of every room, staircase, and attic. The adjoining building, which houses the G. Museum and the G. Library of 60,000 books covering the seventeenth and eighteenth centuries, has recently been reopened after extensive repair.

Editions: *Gotz von Berlichingen* (1773); *Die Leiden des jungen Werthers* (*Sorrows of Werther*) (1774); *Iphigenie auf Tauris* (1777); *Egmont* (1788); *Torquato Tasso* (1790); *Wilhelm Meisters Lehrjahre* (1796); *Hermann und Dorothea* (1798); *Poems*, and *Faust*, Part I. (not pub. till 1808); *Die Wahlverwandtschaften* (novel,

1809); *Aus meinem Leben*, *Dichtung und Wahrheit* (autobiography, 1811, 1812, 1814, and onwards); *Italienische Reise* (*Italian Tour*) (1816–17); *Westostlicher Diwan* (*Lyrics*) (1819); *Wilhelm Meisters Wanderjahre* (1821–29); *Trilogie der Leidenschaft* (1822); *Faust*, Part II. (1832); *Dichtung und Wahrheit* (last vol., 1833). G.'s works were collected at Stuttgart in 1806–10; in 1815–22; in 1827–1830; with posthumous works, 1832–42. *Sammliche Werke* ('Complete Works') in 1868–79, was by Hempel, Berlin. The prodigious Weimar ed. dates from 1887 to 1919. A complete bibliography up to 1910 is in vol. iv. of K. (Goedcke's *Groundplan of the History of German Poetry* (Dresden, 1910).

ENGLISH TRANSLATIONS: Most of G.'s works are in Bohn's Standard Library. *Faust* has been trans. by many, including A. G. Latham (Everyman's Library).

BIOGRAPHIES, MANY COMBINED WITH CRITICISM: It is to the credit of Britain that the first adequate biography of G. was by G. H. Lewes, 1855, though there had been a slighter work by J. W. Schäfer, 1851; H. Duntzer, 1880 (trans. into Eng., 1883); J. Sime, 1888; O. Browning, 1892; A. Bielchowsky, 1895 (Eng. trans. by W. A. Cooper, 1905–8); H. G. Atkins, 1904; H. S. Chamberlain, 1912; Prof. P. Hume Brown, 1920; E. Ludwig, 1920–21 (trans. by Ethel Mayne, 1928); G. Brandes, 1922; J. G. Robertson, *Goethe and Byron*, 1925; and *Goethe*, 1927; A. Schwitzer, *Goethe* 1939, 1949.

CRITICISM: T. Carlyle (whose powerful praise introduced Eng. readers to G.), 1828–32; R. W. Emerson's essay on 'The Writer Goethe' in his *Representative Men*, 1882; J. R. Seeley, 1894; B. Croce, 1919 (Bari, Eng. trans., 1923); Stowell and Dickinson, 1928; H. V. Nevinson, *Goethe, Man and Poet*, 1931; B. Failey, *Goethe as revealed in his Poetry*, 1932, and *A Study of Goethe*, 1948. See also G.'s *Conversations with Eckermann*, 1830 ff. The Eng. trans. gives an impression of the ability with which G. talked.

Goetz de Berlichingen, see BERLICHINGEN, GOTZ VON.

Goetz, Hermann (1810–76), Ger. composer, b. at Königsberg (now Kaliningrad). Briefly remembered for his opera *The Taming of the Shrew* (1874), containing the soprano aria 'Es schweige die Klage' and a septet which is in some sort a counterpart of the *Mastersinger* quintet. The opera has been performed in England, and in Eng. G. also composed a fine second piano Concerto, some instrumental and vocal works, and a good Symphony in F major.

Goetze, Sigismund Christian Hubert (1866–1939), Eng. artist, b. in London, educated at Univ. College School and the Slade School of Art. Frequently exhibited at the Royal Academy and at the Paris Salon. His first notable picture was 'Saint Sebastian' (1894), but he was best known for 'He was despised and rejected of Men' (1904). Other examples of his work are 'Ever Open Door' and 'The Greatest of These.' In 1921 he gave to the nation the frescoes he had painted for

the Foreign Office to depict the origin, development, and expansion of the British Empire.

Gog and Magog, names used sev. times in the Bible. In Genesis, M is spoken of as a son of Japhet; in Ezekiel G. appears as prince of M., an enemy of Israel in the Far N., and in Revelation G. and M. are considered as a comprehensive term for the powers of evil. The names are also given to the two giants in the Guildhall, London. Sev. legends are extant as to their origin, but they seem to have been connected with London hist since the reign of Henry V. The original figures were burnt in the Great Fire, and the present ones made in 1708.



W. I. Mansell

VINCENT VAN GOGH: A SELF-PORTRAIT, 1888

Gogh, Vincent van (1853-1890), Dutch painter. Son of a clergyman at Groot Zundert, N. Brabant. When about sixteen he entered the employment of Goupil & Company, art dealers, and later was sent to England. Disappointed in love he left Goupil's and became a schoolmaster in England. Returning to Holland he studied theology for a year at Amsterdam, and became a missionary among the Belgian miners. Already an artist, he studied painting at The Hague, and in 1881 joined the Antwerp Academy. His brother, in Paris, introduced him to the Impressionists, of which school, or of 'post-Impressionism,' G., with Cézanne and Gauguin, was a leader. He painted at St. Rémy and Arles, associated for a while with Gauguin. Still life, portraits, landscapes, are all equally within his splendidly original scope. But, having been a physical and nervous weakling for many years, he spent his latter days in an asylum at Auvers-sur-Oise, and shot himself.

G. was a daring colourist, whose flying brush-strokes live. It is said that, after

a physical effort of painting, into which he had thrown all his powers with almost volcanic or atomic vehemence, he would sometimes fall in an epileptic seizure. Probably every work of his later years is worth close study. At the asylum his portraits of doctors and others, and his self-portraits, were as great as any. The following are a few of his works which have been specially praised: 'The Yellow Chair,' 'Sunflowers,' 'Cypress,' 'Cornfield,' 'Potato Eaters,' 'L'Arlesienne,' 'Berceuse,' 'Restaurant on Montmartre' (at the Luxembourg), 'Mairie au 14 juillet,' 'Ravine,' 'Pine Forest at Sunset.' See G. B. de la Faille, *Catalogue raisonné*, 1930; J. von G. Bonner (editor), *Letters to his Brother* (with memoir), 1927; J. Stone, *Lust for Life* (a novel), 1934; Van Gogh Paintings (introduction by G. Reynolds), 1947; and A. Artand, *Van Gogh, le suicide de la société*, 1948; also life by L. Piérard, 1925.

Gogo, W. Africa, see GAO.

Gogo, port and tn. of Bombay, India, situated in the Ahmedabad dist. There is a safe anchorage for vessels, and the tn. is commercially important. Cotton and salt are the chief products. Pop. 30,000.

Gogol, Nicolai Vasilievitch (1809-52), Russian author, b. at Sorochintsy, Poltava; educated at Nizhniu, and in 1829 went to St. Petersburg, where for a short time he was a gov. clerk. He made sev. unsuccessful attempts to gain a footing in literature, but in 1831 produced *Evenings in a Farm near Dikanka*, which became very popular. A second series appeared in 1834. This work is a collection of stories and sketches of sev. types, depicting the life of Little Russia with great truth and vigour. Love of nature and of the supernatural, humour, pathos, and descriptive power are among the attributes of the writer's style. Among the best of the tales are *Taras Bulba* (Eng. trans. 1887), a thrilling account of the Zaporozhian Cossacks, *Old-World Gentlefolks: How the Two Irans Quarrelled* (trans. 1945); *Mervin Prospect* (1868); and *Itakha Alakirevitch's New Cloak* (1835). In 1836 he produced *The Government Inspector* (Eng. trans. 1891 and 1893), a comedy exposing the vices of prov. administrative officials; and in 1837 his best work, *Dead Souls* (Eng. trans. 1886), a strong and gloomy novel dealing with prov. life. During 1836-46 G. lived abroad, mainly in Rome. His collected works and correspondence appeared at Moscow in 6 vols. in 1856-57. See E. Turner, *Studies in Russian Literature*, 1883, and V. Nabokov, *Akhooli Gogol*, 1947; also lives by P. Kulisch, 1858, and E. Zabel, 1899.

Gogra, riv. of Oudi, India, rising in the Himalayas. It flows S.E. and enters the Ganges just above Chapra, after a course of 600 m. It is navigable almost to the mts., and at its junction with the Ganges is from 1 to 3 m. wide.

Goidels, one of the primitive races of Britain. They were a Celtic tribe which invaded Neolithic Britain, driving their predecessors into the W. of Ireland. They

were themselves driven out by the Brythons.

Goitre, swelling of the thyroid gland, which is situated in the front of the neck. It is also known as Derbyshire neck. The condition is more prevalent in some countries than others, and occasionally it is so common that practically all the inhabitants of a certain locality are affected by it. Sometimes it is specially prevalent in mountainous dists.; at others it appears in lowland ones. As a rule scattered cases are more common in women than in men. The importance of the condition depends upon the fact that the thyroid gland, which is essential to the nourishment of the whole body, is attacked in G., and its functions may be so impaired that the skin, hair, and teeth are affected. The aspect of the patient is characteristically altered; the powers of mind and body are impaired; this weakness gradually increases, and the receptive powers of hearing and sensation are lessened. This condition is known as myxoedema and in Ger. the term *Struma* is applied to it. This, however, is somewhat rare when the gland has increased in size, as sufficient remains healthy to supply the needs of the body. Apart from the myxoedematous symptoms, the enlargement of G. presses on the windpipe and considerably impedes the respiration.

Exophthalmic Goitre.—In this condition in addition to increased size of the thyroid there is exophthalmos, that is protrusion of the eyeballs and rapid action of the heart. At first one or two only of these symptoms may be present. To this extent the condition is the opposite of myxoedematous G., as it is due to an increased action of the thyroid instead of a decrease of activity. Here the mental condition is one of irritability rather than impairment. The condition is frequently first noticed after some severe mental shock. In both conditions if the gland presses on the windpipe surgical measures must be adopted. In the myxoedematous condition the deficient action of the thyroid can be supplemented by taking the thyroid extract of animals, but in restricted amounts for fear of causing rapid action of the heart, as in exophthalmic G. This, however, is not often required in G. itself, because sufficient of the thyroid gland remains in a healthy condition to supply the needs of the body.

Gokhale, Gopal Krishna (1866-1915), Indian political leader; b. at Kolhapur; parents of caste of Chitpavan Brahmins. Graduated Elphinstone College, Bombay; became prof. Ferguson College, Poona, at £60 a year. Joined Congress movement; about 1887, secretary to the Sarvajanik Sabha. In England, 1897, witness before royal commission on Indian expenditure. In 1900 elected to Bombay Legislative Council. Soon afterwards selected by its unofficial members to represent them on Imperial Council. Leader of opposition there; nevertheless on recommendation of Lord Curzon G. became C.I.E., 1904. In 1905 (in which year he was president of Congress) founded Servants of India Society, to prepare India

for self-government. On royal commission on public services in India, 1912. See R. P. Paranjpye, *G. K. Gokhale*, 1915.

Golasecca, small vil. on the Ticino R., a few miles from the point where it flows into Lake Maggiore, Italy. It is situated on the site of a famous cemetery of the Iron Age. The first discoveries in this region were made in the early nineteenth century by the Abbé Gianni. Castelfranco followed it up in 1874 and pub. accounts which have formed the basis of all later study. The cemetery consists of hundreds of circles made of unworked stones—each circle containing a prehistoric tomb, which itself contained a cinerary urn, and sometimes a vase, weapons, and small objects of iron, amber, glass or bronze.

'**Gold, Salomon von**', see LOGAU, FRIEDRICH VON.

Golconda, decayed city of India, 7 m. W. of Hyderabad, in the Nizam's dominions. It was once the cap. of a powerful kingdom of G., and still possesses a strong fortress, built on a granite ridge, and now used as a state treasure and prison house. It was at one time famous for diamonds, which were cut and polished here, and for the immense mausoleums of the anc. kings.

Gold (symbol Au, atomic number 79, atomic weight 197·2), metallic element that has been known and valued from the earliest times on account of its occurrence in the free state, the ease with which it can be beaten into articles and ornaments, and its unalterability by water or air. The importance of G. as a metal has certainly not lessened in our day, in fact it is used as the standard for exchange (see BIMETALLISM; CURRENCY). G. is found almost always in the free state, and sometimes in combination with silver, mercury, and tellurium; it is very widely distributed, and in fact there is scarcely a country or deposit in the world which has not been found to contain G. It occurs principally in rock formations, or in alluvial deposits. The latter, which constituted the chief sources of the G. supply until recently, are termed 'placers,' and consist of an accumulation of gravel, sand, and clay, mixed with particles of G. varying from minute grains to nuggets of considerable size, which have been removed from their original habitat by the action of water and redeposited, e.g. in a hollow of a riv.-bed, the G., by reason of its great density, accumulating in places where the current is least. These auriferous deposits may also be covered by more recently distributed material and are then termed 'deep leads' or 'dead rivers.' In Europe the most important alluvial deposits are those in the Uralis; in Asia those of Siberia; in Africa those of the Rand. A valuable 'strike' was made at Odendaalsrust in the Orange Free State in March 1946. In America the Californian deposits were the cause of the 'rush' of 1849 and are now practically exhausted; the Klondike dist. in Yukon, Canada, also attracted considerable but short-lived attention. Australia contains the most famous alluvial deposits, which have been marked by the occurrence in

them of nuggets of considerable weight. The largest ever found, the Welcome nugget, discovered in 1858 at Ballarat in Victoria, weighed 183 lb. and was worth £8376. In all cases the recovery of alluvial G. is in principle remarkably simple; the apparatus in which the 'washing' is carried out may be a pan, a cradle, or a tom, whilst for large operations a sluice is used. Where the deposit is not actually near a riv.-bed water is conveyed to it under pressure by means of a pipe line, so that it can be thrown in powerful jets against the banks of gravel, which is thus washed down sluices, the G. being collected as before. Alluvial deposits are now of less importance than the rock deposits in which G. is found. In these the metal occurs in veins, reefs, or conglomerates of quartz and other silicious material in the form of small particles, sometimes embedded in iron pyrites, copper pyrites, or lead ores. The auriferous rock, which is often mined at considerable depths, is first subjected to crushing and then reduced to a very fine powder by stamps, five of which usually go to form a battery. A stream of water is circulated through the mortars, and the fine particles of G. are collected on amalgamated copper plates. The G. amalgam is from time to time removed and the mercury distilled off, leaving the G. behind. The material that escapes still contains some G., and is now concentrated by methods similar to those used in treating alluvial deposits. The concentrates, if free from pyrites, are treated with mercury, the G. being recovered from the amalgam formed. The above method of stamping and amalgamation works satisfactorily with 'free-milling' ores comparatively rich in G., but those ores containing sulphides require chemical treatment to remove the metal from the finely powdered material.

The chlorination process is used for treating concentrates containing sulphides and for recovering the G. that escapes amalgamation. The material is first roasted to remove the sulphur and convert the base metals into oxides. It is then placed in large vats, moistened with water, and treated with chlorine gas, which readily converts the G. into the form of chloride which is washed out, the G. being precipitated in the metallic state by means of ferrous sulphate (copperas).

The cyanide process, introduced on the Rand in 1891, is now almost exclusively used for the recovery of finely divided G. It is extremely simple, and consists of allowing the finely crushed ores, concentrates, or slimes to stand in vats with a dilute solution containing from 0.05 to 0.3 per cent of potassium cyanide. After a day the solution is run off, and the G., which is in solution in the form of a double cyanide with potassium, is precipitated by zinc shaving or by electrolysis, not more than $1\frac{1}{2}$ grains of G. being left in each ton of solution. The metal obtained by any of the above methods is generally alloyed with silver, and contains small quantities of iron, lead, sulphur, etc.

Properties.—G. is a soft yellow metal, which appears red when seen by light many times reflected from its surface. In a finely divided state it appears purple and even black, and when gold-leaf is viewed by transmitted light it appears green. It is a very heavy metal (sp. gr. 19.4), melts at 1067° C., boils at 2610° C., and is volatile at the temp. of the electric arc. It has a specific heat of 0.0316, is a good conductor of heat and electricity, and is quite unaffected by air and most reagents. G. is the most malleable and ductile of metals, and may be beaten out into leaf having the thickness of only $\frac{1}{25,000}$ th part of an inch; thus one grain of the metal may be made to cover 56 sq. in. of surface, or drawn into a wire 500 ft. long. It has little affinity for other elements, and is easily reduced from its compounds. Most metals when placed in a solution of a G. salt precipitate it, and all its compounds when ignited yield the metal. G. is readily deposited upon other metals by the process of electro-gilding, the most suitable solution being that of the double cyanide of G. and potassium ($\text{Au}(\text{CN})_2 \cdot \text{KCN}$). In the presence of the two chlorides of tin G. chloride forms a purple compound known to the ancets. as purple of Cassius. Colloidal G. may be formed by Bredig's process of striking an arc between G. wires under water, or by reducing solutions of gold with phosphorus, formaldehyde, etc. For the purposes of coinage G. is alloyed with two parts in twenty-four of copper or silver to harden it against the wear and tear of circulation. For use in jewellery various alloys are employed, the 'fineness' being expressed in parts of pure G. in twenty-four; thus 18-carat G. is composed of eighteen parts of the metal alloyed with six parts of copper or silver as the case may be. Silver gives the alloy a paler, copper a redder, colour, than that of the pure metal. The chief alloys used by the jeweller are

Parts pure G.

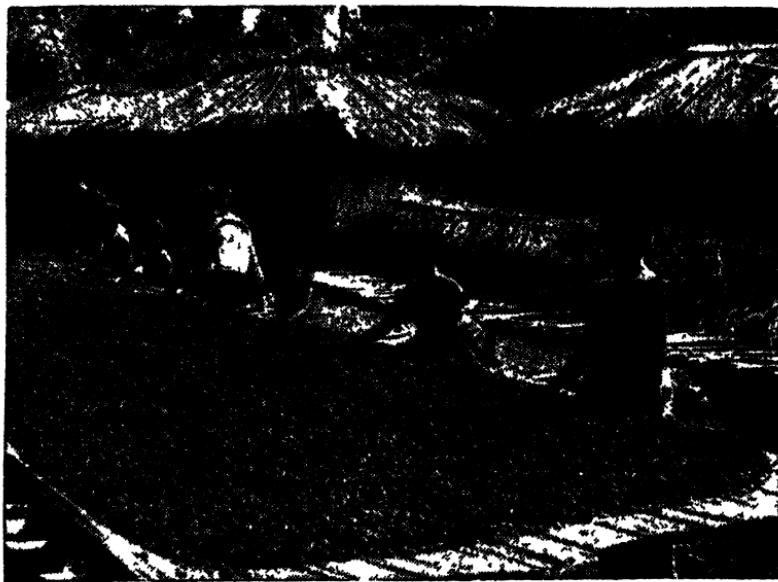
Red G.	= 75 + 25 parts	copper
Dead leaf G.	= 70 + 30	" silver
Green G.	= 75 + 25	" "
Water-green G.	= 60 + 40	" "
Blue G.	= 75 + 25	" iron

The attempt to produce G. from base metals was the age-long goal of alchemy. Such a transmutation was entirely beyond the powers of the alchemists, however, and although modern work on the structure of the atom indicates that the problem is by no means insoluble, it is unlikely to become a commercial proposition, at any rate in the near future.

The world production of G. fluctuates, but in more recent years has ranged from 30,000,000 to 37,000,000 fine oz. The returns pub. in 1939 gave the following totals in fine oz. for pure G.: Transvaal, 11,740,000; U.S.A., 7,700,000; U.S.A. (including Philippines), 4,800,000; Canada, 4,100,000; Australia and New Zealand, 1,900,000; Japan and Korea, 1,380,000; Mexico, 840,000; and S. Rhodesia, 800,000. Later figures are available in

some cases: Transvaal (1944), 12,277,230 fine oz., valued at £103,128,720; U.S.A. (1946), 1,462,354 troy oz., valued at \$51,182,390; Canada (1946), 2,807,643 fine oz., valued at \$103,180,880; Australia (1946), 824,480 fine oz., valued at \$8,873,468; and S. Rhodesia (1946), 544,596 oz., valued at £4,897,526. In 1939 one oz. (troy) weight of G. was worth £3 17s. 10½d. and one oz. of pure (G., 24 4s. 11½d. The average market price of pure G. fluctuated with the dollar-sterling exchange, averaging 140s. 9d.

coast is mainly flat and swampy, and a heavy surf makes landing from vessels very difficult. In 1928, however, an excellent harbour was completed at Takoradi, near Sekondi, the only good shelter for large ships between Nigeria and Sierra Leone. There are sev. bold headlands and numerous lagoons. The land is flat for some distance from the sea, but rises towards the interior. The G. C. is rich in minerals and other produce, but cocoa is the mainstay. In 1900 the quantity exported was negligible, whereas



Cadbury Bros Ltd

A GOLD COAST (ASHANTI) COCOA FARMER AND HIS FAMILY
DRYING COCOA BEANS

per oz. The price in 1948 was 172s. 3d per fine oz. See also BULLION; CURRENCY MONEY.

Gold, Field of the Cloth of, name given to the meeting in June 1520 between Henry VIII. of England and Francis I. of France, near Calais. The proceedings, in which Wolsey took a prominent part, and which resulted in the signing of a treaty between the two kings, were characterised by the utmost splendour and extravagance.

Gold-beating, see GOLD LEAF.

Gold Coast, Brit. crown colony and protectorate in W. Africa, extending for 331 m. along the gulf of Guinea, and bounded on the E. by Togoland, on the W. by the Fr. Ivory Coast, and on the N. by the Fr. Sudan. It includes Ashanti and the dist. known as the N. Tera. The combined area is 78,650 sq. m., that of the G. C. colony alone being 23,490 sq. m. The

by 1938 some 300,000 tons or practically half the entire world supply was produced. This production is entirely in the hands of the African farmers, who receive the advice and help of the Agric. Dept. of the G. C. Gov. The firm of Cadbury's is a household word in the colony—Cadbury Hall and the Hunter Hostel, where young Africans are trained in matters appertaining to agriculture, are both gifts of the company. The low-lying land is very fertile, and palms of various kinds, coffee, cocoa, calabar beans, cereals, ground-nuts, ginger, camwood, tobacco, etc., are largely grown. The cultivation of rice and sisal-hemp has been started. Maize has been planted in the old forest land and is the prin. food crop for domestic consumption in the G. C. There are some timber exports, but they are not comparable with the leading exports. The N. border of the high forest is receding.

while within the forest belt further S. extensive areas have been cleared for the cultivation of cacao—the total area cleared has been estimated at 1,000,000 ac. The area of high forest remaining to-day is less than 14,000 sq. m. and it is estimated that nearly 300 sq. m. are destroyed yearly, so that little will survive in forty years' time. In 1926, despite native opposition, a Forestry Bill was passed and became law. It provided that the gov. should constitute forest reserves, but that they should continue to be the property of the 'stools,' but this policy has not been a success. Other forest areas have been denuded to supply the mines with timber. Gold, from the production of which the colony derives its name, and which was mined by the natives before the coming of the Europeans, is found in large quantities, the chief mines being at Tarkwa and Prestea in the S.W. The gold-mines had been famous since the fifteenth century; modern equipment and European methods were introduced in the seventies. But transport facilities did not exist, and transport costs absorbed all profit. A brief boom was followed by a period of stagnation, until the completion of the railway line to Tarkwa in 1901 and to Kumasi in 1903. Diamonds and manganese are also mined. The chief exports are cocoa, palm oil, rubber, palm kernels, mahogany, copra, nuts, ivory, gold dust, diamonds, and manganese. There are some 12,000 cwt. of exports of hides and skins; but as regards livestock in the N. part of the country the control of rinderpest has led to a rapid increase in stock and overgrazing has, in consequence, become a serious problem as elsewhere in Africa.

The climate is hot and damp, and is unhealthy, particularly near the coast. The unhealthiness is, however, rapidly decreasing, owing to the drainage of swamps, improved sanitation, and advances in medical science, and the G. C. now little merits its former title of the White Man's Grave, but no Europeans settle and live there. The chief tns. are Accra, the cap. (pop. 75,000), Cape Coast, Sekondi, Adidah, Tarkwa, Elmina, Kwitta, Saltpond, Winneba, Axim, and Akuse in the G. C. itself, Kumasi and Kutampio in Ashanti, and Tamale and Navrongo in the N. Ters. Roads, railways, telegraphs, etc., in the colony have been much developed in recent years. In 1930 there were 500 m. of railway, running from Accra and from Sokondi to Kumasi, and from Huni valley to Kade. There are also 6400 m. of motorable roads in the G. C., Ashanti, and the N. Ters., and 5000 m. of telegraphs; and over 11,000 m. of telephone trunks have been estab. There is a wireless station at Takoradi and there are wireless posts for inland communication at Accra, Kumasi, and sev. other tns. A gov. railway runs from Takoradi through Tarkwa to Kumasi and thence to Accra (366 m.), with branches (490 m. altogether). The Awase line (46 m.), owned and constructed by the Ministry of Aircraft Production for the carriage of bauxite, is also operated: there is an airport at Accra. Sev. of the tns. are lighted

by electricity and have pipe-borne water supplies. Schools, hospitals, and asylums have also been estab. The colony has over 600 schools of approved standard and over 1000 sub-standard and the majority of the schools are managed by churches and missions, with liberal grants in aid by the gov. Attendance is not compulsory nor free. There are also technical schools. Post-secondary education is provided at Achimota College, which was opened in 1925 at a cost of £500,000 and built and endowed by the gov. African children can enter at the kindergarten stage and go through to univ. standard. There are on an average some 500 students at Achimota College. In 1943 a grant of £127,000 was made by the imperial gov. to establish a W. African institute of arts, industries, and social science, in the vicinity of Achimota College.

The government of the G. C. colony is administered by a governor, aided by a nominated executive council, with one unofficial member who was appointed in 1942. There is a legislative council with an 'unofficial' African majority (1948) for the colony, excluding Ashanti and the N. Ters. The administrative service is opened to W. Africans. The mandated ter. of Togoland is also administered by the governor. The G. C. system of native administration has been designed to show the greatest possible respect to the position of the chief as representative of the 'stool'; but this policy in itself forbade the application of that measure of control which made it possible to treat native institutions elsewhere as effective agencies of self-gov. ('indirect rule') and in the wide range of matters outside the sphere of stool interests, administration inevitably tended to take a direct form. In 1927 the gov. accepted a Bill put forward by a number of chiefs and embodied in the Native Administration Ordinance of that year. This ordinance recognised as part of the hierarchy of administration not only the chiefs, but their councils; the paramount chiefs' tribunals received appellate powers and their original powers in civil cases were enhanced. But the most important provision lay in the recognition of the Prov. Council, consisting of the head chiefs of the three provs., as the tribunals for the trial of issues between paramount chiefs, divisional chiefs, and the chiefs of provs. In 1931 an ordinance was passed to enable paramount chiefs to make by-laws establishing native treasuries, but such by-laws have not yet been passed in many states. In religion the people of the G. C. remain for the most part Animists, but there are many Moslems and the number of Christians is increasing. Save where religious ritual has involved human sacrifices, the Brit. Gov. has not interfered with the traditional beliefs of the African peoples. Thus the gov. would intervene in a case of ritual murder, as, for example, in 1945 when a number of men were sentenced to death for the murder of the Akyea Mensah, the Odikro of Apedwa, who was sacrificed to the spirit of the late paramount chief, Nana Sir Ofori Atta.

History.—The Portuguese were the first white settlers in the country; they built a fort in 1482 at St. Jorge de Mina, now known as Elmina. In 1625 the Dutch, who had built some forts in 1598, made a treaty with the Asenbu tribe, captured the Portuguese fort and garrison of St. Jago, near Elmina, and when, in 1642, they took Axim, the Portuguese, after a settlement of 160 years, left the G. C. for ever, and for the next 200 years—till 1872—the hist. of the G. C. is the story of the struggle between the Eng. and the Dutch. The dist. was first settled by the Brit. in the seventeenth century, and the trade in gold dust and slaves was very large for some time, being mainly carried on by chartered companies. As early as 1618 James I. granted a charter to a London company of adventurers for 'adventuring in the golden trade of Africa,' and this is reckoned as the date of the foundation of the G. C. colony, making it one of the earliest in the Brit. Empire. About the middle of the seventeenth century Swedes, Danes, and Germans, competing for the trade, put up forts or castles at Sekondi, Shama, and elsewhere, while the Eng. built Cape Coast Castle (1662) and the Danes a fort at Christiansborg (now the residence of the governor of the G. C.) in 1657. In 1665 war broke out with the Dutch over these competing rights and the Dutch seized Cape Coast Castle. But after the peace of Breda a new company, under the patronage of Charles II., built seven more castles along the coast, besides enlarging Cape Coast; and in 1673 these events were celebrated by the coining of 50,000 gold pieces bearing the company's stamp—an elephant; these were called 'guineas,' because they were struck in the gold brought by the company from Guinea. In those days the G. C. was not a colony in the modern sense, and nothing was known of the hinterland except that the prisoner-of-war slaves were brought down from it by the Ashantis to the waiting forts on the coast. So long as slavery existed the Eng. provided a natural market for the slaves; with its abolition the Eng., now desiring only peace for legitimate trade, became the natural enemies of the bellicose Ashantis, and in all there were seven Ashanti wars and two invasions between 1800 and 1900. The last of the chartered companies was dissolved in 1821 when the Crown took possession of the forts and settlements, though previous to this Brit. territorial rights had been conceded by the Ashantis, after the battle of Dodowah (1826), at the end of the first phase in the struggle with them. The gov. then set up a legislative council and an Eng. court and sent out as governor Capt. George Maclean, one of the greatest figures in Eng. colonial hist. and the first European to attempt to understand African tribal law. In 1850 and 1871 the Brit. obtained from Denmark and the Netherlands their possessions in the dist.

By a process of absorption the Eng. had become the only Europeans on the coast, but it was only after considerable difficulties that the Eng. power could be

said to be consolidated. In 1873 the gov. appointed Sir Garnet Wolseley as governor and commander-in-chief to deal with the Ashanti invasion of that time. Wolseley's white troops marched northwards by the newly cut road to Frafra, the Ashantis retreating before them; and of 40,000 Ashantis who had marched out from Kumasi only 20,000 returned, and these only returned with the Eng. troops close behind them. This was the first time white soldiers had followed the Ashantis into their own ter. On Feb. 4 the Eng. entered Kumasi and destroyed it. Later the treaty of Fomena was signed by which the G. C. (now separated from Sierra Leone) was declared a colony under Brit. rule and its tribes entirely free from Ashanti dominion. The next twenty-five years were occupied with the gradual subjugation of the Ashantis, the agreement of territorial boundaries with France and Germany—both had begun to penetrate into this part of W. Africa—and the opening up of the gold-fields by Europeans. In 1886, however, another expedition, under Sir Francis Scott, had to march to Kumasi, where Scott demanded from the chiefs payment of the indemnity agreed upon at the treaty of Fomena. Payment was not forthcoming, nor had human sacrifices ceased. Hence next day Prempeh (q.v.), the Kumasi chief, and seven other chiefs and the queen-mother, were deported to the Seychelles (q.v.). A fort was built at Kumasi to hold a garrison of 300 men. In 1900 Sir F. Hodgson, the governor, visited Kumasi and demanded the surrender of the golden stool, a magic symbol which the Ashantis believed had come from the gods and was in fact the symbol of their tribal confederacy (see GOLDEN STOOL). The result was that Hodgson was besieged in the fort and had eventually, together with his retinue and the garrison, to cut a way out to the coast. The chiefs were deposed, but the Brit. prudently refrained from repeating their demand for the golden stool. Since 1901, in which year Ashanti was annexed to the G. C. and the N. Ters. came under Brit. protection, there have been no wars but continued peace and development, for the Brit. Gov. has learnt the danger of ignoring tribal beliefs and has made their recognition and understanding an essential part of the prevailing policy of 'indirect rule.' Since 1900 exports from the G. C. have grown from £885,000 to £9,000,000 in 1935 (cocoa £5,200,000; gold £2,600,000; manganese £500,000; and diamonds £500,000)—an eloquent testimony to the profound change in the conditions prevailing throughout the country.

There were serious disturbances in Feb.—March 1948 which arose immediately out of the increased cost of living, due to the general dislocation of world trade. A formidable riot involving some 50,000 people broke out in Accra, attacks being mainly concentrated on shops owned by Syrians, Indians, and Europeans. The police used firearms to stop a procession of 2000 ex-servicemen and others from marching on the governor's official residence at Christiansborg Castle. The

insurrection, exploited by political extremists, assumed a nationalistic and xenophobic character and spread to the schools run by religious communities in Accra. The gov., which was taken aback by the extent of the violence, called in troops and imposed a curfew and press censorship. The disorders spread over the country to Kibi, Koforidua, Akuse, and Suhum, while the situation in Accra was being brought under control. A fortnight after the outbreak in Accra, rioting had practically ceased in all towns except Kumasi. Some fifteen persons were killed and 115 injured. The activities of political extremists of the United G. C. Convention, which made its first appearance as a political organisation in Aug. 1947, rendered the situation more complex than it would have been had it been due solely to economic causes. According to the governor's report these activities showed links with Communist organisations overseas, and the aims of the convention, while ostensibly the attainment of self-government, were in fact revolutionary, as indicated in a manifesto addressed to the chiefs which was pub. in the press under the title 'The hour of liberation has struck.' Leadership of the convention was dominated by lawyers, many of whom had been trained and resided abroad. Its president, Dr. Danquah, a wealthy timber merchant, had figured in the political life of the G. C. for many years. A commission of inquiry was appointed by the governor to investigate the disturbances and their underlying causes. The commission's report (pub. Aug. 4, 1948) states that the convention, through its working committee, were active in promoting every form of complaisant likely to influence an excitable populace with a disproportionate sense of grievance. The report summarises the underlying causes of the disturbances as follows: (Political) the large number of African soldiers returning from service, where they had lived under better conditions, made for a general communicable state of unrest; a feeling of political frustration among the educated Africans, who saw no prospect of ever experiencing political power under existing conditions; a failure of the gov. to realise that, with the spread of liberal ideas, increasing literacy, and a closer contact with political developments in other parts of the world, the star of rule through the chiefs was on the wane; resentment at the growing concentration of certain trades in the hands of foreigners, especially Syrian merchants; (economic) the gov.'s neutrality in the dispute over the high prices of imported goods; the gov.'s acceptance of the scientists' finding that the only cure of swollen shoot disease of cocoa was to cut out diseased trees, and their adoption of that policy, coupled with allegations of improper methods of carrying it out; the degree of control of the Cocoa Marketing Board limiting the powers of the farmers representatives to control the vast cocoa reserves; (social) the alleged slow development of educational facilities and the almost complete failure to provide any

technical or vocational training; the fear of wholesale alienation of tribal lands, leaving a landless peasantry; inadequacy of the legal powers of government necessary to deal with speeches designed to arouse disorder and violence. Among the recommendations of the commission were proposals for a basis of constitutional reform for a probationary period of ten years, the new constitution of 1946 being described as having been 'outmoded at birth,' and reference was made in the report to an intense suspicion among the people 'that the chiefs are being used by the government as an instrument for the delay if not the suppression of the political aspirations of the people.' The recommendations made by the commission are calculated to develop a pattern of government which will conform in some respects to the government in the United Kingdom. Apart from towns, which will have their town councils, the affairs of rural areas in matters of purely local concern will be dealt with by a local authority corresponding in some ways to a rural district council. Matters of wider regional concern will be dealt with by a regional council with an administrative structure not unlike a county council. The legislative body with parl. status will be the G. C. Assembly, functioning with a board of ministers acting as an executive council. The United Kingdom gov., in a statement pub. at the same time as the report, commented that 'a European system cannot be imposed arbitrarily on an African society; readiness to give must be matched by willingness to receive'; and it is suggested that the manner of presentation of some of the commission's proposals might lead to misunderstanding, and that the comments on chiefs did substantially less than justice to the strength of the tradition and custom which a large part of the G. C. still regarded as essential to an ordered society. But the gov. was in agreement with the principles underlying the recommendations for constitutional reform, since they were pledged to assist the people of the G. C. in their progress to self-government as rapidly as conditions permit, though they did not accept the criticisms of the 1946 constitution. While they attach importance to modernising the native authorities and making them fully representative, the gov. regard the chiefs as having an essential part to play, since they are the traditional leaders of the people. It is intended to set up a local representative committee to consider the extent to which the proposals can be accepted. If the proposals are acceptable to local opinion the United Kingdom Gov. would—subject to reservations—be prepared for their early implementation. The United Kingdom gov. also agreed with the commission that the membership of the legislative council should be increased, that this body should be presided over by a Speaker, and that the executive council should consist of nine members, of whom four would be *ex officio* members and five Africans. The gov. suggests that there should be three salaried full-time African members, with responsibility for health,

labour, and social welfare, for education, and for communications and works; and they also agree that the executive council would be the body where all major questions of policy would be discussed, and as such the foundation from which a Cabinet would eventually be developed.

Pop. (African), census for 1931: The colony 1,645,140; Ashanti 583,866; N. Ters. 717,283; Brit. sphere of Togoland 275,925; Accra 59,895; Kumasi 36,200; non-African, about 2400, mainly Brit. In March 1942 the pop. was returned at G. C. colony 1,940,789; Ashanti 737,072; N. Ters. 890,170; Togoland 391,473. Total 3,959,510.

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Golden Age, phrase applied to the most prosperous and beautiful period of a country's hist., art, literature, etc. The idea originated with the Gks. Hesiod divided the life of a race into five ages, of which the golden, or simple and patriarchal, age was the first. The theory was developed into a regular system of cosmic philosophy, which made Saturn the governing deity of the G. A.

Golden Ball, see **GLOE FLOWER**.

Golden Bull, imperial edict issued by the Emperor Charles IV. in 1356, which fixed the law in regard to the imperial elections, and provided that only one member of each electoral house should have a vote. So-called from the gold case enclosing the imperial seal (*Lat. bulla*) attached.

Golden Calf, idol made by Aaron from the golden earrings of the Israelites and worshipped by them when Moses was absent on Mt. Sinai (Exod. xxxii). It

is probable that the gold in thin plates covered a core of wood. Moses burnt the G. C. and ground it small, then cast it into the brook and made the people drink the water (Ps. cvi. 19).

Golden Carp, see **GOLDFISH**.

Golden-crested Wren (*Regulus cristatus*), smallest of European birds, belonging not to the family of the true wrens but to that of the *Sylvidae*. The length of the body is about 3½ in., and the plumage is very beautiful. The back is greenish-yellow, the wings and tail are ash brown, marked with black and white, and the cheeks and throat greyish white, while the crown feathers are elongated into a bright yellow crest. It is found all over Europe, and is not uncommon in Great Britain, particularly frequenting fir woods.

Golden-eye Fly (*Chrysopa perla*), or **Lacewing Fly**, common Brit. neuropterous insect. In colour it is pale green, with long antennæ, gauzy wings, and bright yellow eyes. The length from the tip of the antennæ to the tip of the closed wings is almost 1½ in. The eggs are attached to leaves, etc., by stalks; the larvae are rough and hairy and feed on aphides, and the pupa is enclosed in a white silky cocoon. The name is also applied to an allied species, the *C. vulgaris*.

Golden Fleece, see **ARGONAUTS** and **JASON**.

Golden Fleece, Order of the (Fr. *La Toison d'Or*), one of the prime knightly orders of Christendom, belonging to Austria and Spain. It was founded on Jan. 10, 1429, by Philip III (the Good), duke of Burgundy and the Netherlands, at his marriage with Isabella of Portugal at Bruges, and dedicated to the Virgin and St. Andrew. The source of the name is variously given as the story of the Argonauts, the story of Gideon, the wool trade of Flanders, and the golden hair of the duke's mistress, Marie de Rambrugge. The order had considerable political influence, having power to censure the grand master, i.e. the sovereign. The grand mastership, which had been filled by the Hapsburg kings of Spain from the loss of the Netherlands till 1700, was claimed in 1713 by the Emperor Charles VI, and the subsequent dispute was tacitly settled by the introduction of the order into both Spain and Austria. See B. H. Kenyon de Settenhove, *La Toison d'Or*, 1907.

Golden Gate, strait of California, U.S.A. It is about 1 m. in width, and connects the San Francisco bay with the Pacific Ocean.

Golden Horn, narrow inlet of the Bosphorus, separating Constantinople (q.v.) from Galata and Pera.

Golden Horn Bay, see **PETER THE GREAT GULF**.

Golden Legend, medieval collection of lives of the saints, made by a Dominican, Jacobus de Voragine (1230-98), who was for some years archbishop of Genoa. The collection is in five sections and contains 182 chapters. It was very popular, and was trans. into many European languages. An Eng. trans. by Wm. Caxton appeared in 1483. See the critical ed. by J. G. T. Gräuse (Dresden), 1846.

Golden Retriever, see RETRIEVER.

Golden Rod, or *Solidago Virgaurea*, species of Composites which is found in Britain and is the only Brit. representative of its genus. The leaves of the plant have sometimes been used to make an infusion as a substitute for tea. There are numerous allied species scattered over America, e.g. *S. canadensis*, the Canadian G. R.



GOLDFINCH

Golden Rose, emblem wrought of pure gold, which is blessed by the pope on *Lectare Sunday*, the fourth Sunday in Lent. Occasionally it is sent as a mark of papal favour to some Catholic prince or dignitary, to cities, churches, etc.

'**Golden State**', see CALIFORNIA.

Golden Stool, symbol of Ashanti tribal confederacy. It is made of wood but plated and ornamented with gold. It was at first thought by Brit. administrative authorities to be a throne, but re-searches have shown that it is a sacred object enshrining the spirit of the Ashanti people. After the Ashanti wars and the dissolution of the tribal confederacy when a Brit. protectorate was set up, and the Ashanti chief, Prempeh (q.v.), was exiled, the G. S. disappeared. Hidden the stool was the symbol of the continued but, as it were, underground life of the Ashanti nation under Brit. rule. The Brit., having by 1921 come to realise the veneration in which the stool was held, no longer demanded its production as a throne, and in that year the governor of the Gold Coast explicitly stated that the Brit. made no claim to the stool. The reward for this act of policy came in 1935 when another Prempeh, already king of Kumasi, was formerly installed as king of Ashanti. The G. S. was publicly carried in procession before the Brit. governor at this installation. Thus the famous stool was, in effect, a declaration, significant because of its symbolic form, of the confidence of the whole Ashanti people in the Brit. as guardians and protectors of their national well-being.

Golder's Green, a suburb of London, is situated on the R. Brent, 1½ m. N.W. of Hampstead, in the par. of Hendon. Here

is the crematorium for N. London. Also noted for Golder's Hill Park. Pop. 6000.

Goldfinch (*Carduelis elegans*), beautiful Brit. bird belonging to the Fringillidae. It is about 5 in. long, and the plumage of the adult male is a handsome mingling of black, crimson, yellow, and white. Its intelligence and pleasing song make it a favourite cage bird.

Goldfish, or **Golden Carp** (*Carassius auratus*), common fresh-water fish native to China and Japan. In its natural state it is brown in colour, but when domesticated it develops the familiar red-gold tint, and occasionally becomes a complete albino, when it is known as the silver fish. It was introduced into England in 1691, and breeds freely in aquaria or ponds, provided that the water is kept up to a high temp.

Goldie, Sir George Dashwood Taubman (1846-1925), Eng. administrator, b. in the Isle of Man; educated at Woolwich and entered the Royal Engineers. He first visited the Niger country in 1877, and began to work towards adding the dist. to the Brit. Empire. In 1879 he formed the United African Company, which united the Brit. commercial interest of the dist. In 1886 a charter was granted to the company, which became the Royal Niger Company, with Lord Aberdare as governor and G. as vice-governor. G. succeeded Lord Aberdare as governor in 1895. In 1897 he organised and personally conducted a successful expedition against the Muslim tribes of Nupé and Illorin. In 1895 he became president of the Royal Geographical Society. He was made Privy Councillor in 1898. See Lady Dorothy Wellesley, *Sir George Goldie: Founder of Nigeria*, 1934.

Golding, Arthur (c. 1538-c. 1605), Eng. translator, b. in London and served under the protector Somerset and Sir Wm. Cecil. His chief work is a trans. of Ovid, pub. 1565-67. G. wrote an introduction deducing a moral from the tales. His trans. was a great favourite with the Elizabethan writers. He also trans. several religious works.

Goldingen, see KUDIGA.

Gold Lace, fabric made of cotton or silk thread covered with fine metal wire, and much used for uniforms, theatrical dresses, etc., and cecil. purposes. The metallic wire employed is made from various substances. In the best qualities pure silver is used, but an alloy of copper and silver is more common, and for very cheap lace copper wire is employed. This wire is annealed and plated and then covered with pure gold leaf, which is made to adhere by heating to red heat in charcoal. In the cheapest varieties the copper wire is electro-plated with silver, and this again electro-plated with gold. The completed wire usually measures 1100 to 1400 yds. to the ounce of metal, and is flattened by steel rollers before being wound over yellow silk or cotton thread by a spinning engine. Much gold thread is manufactured in India.

Gold Leaf, tissue of that metal, beaten out to $\frac{1}{250}$ in. in thickness. It is beaten out to such a fineness for the purpose of

gilding various surfaces. The art of gold-beating was known to the anc. Egyptians 5000 years ago, and the coffin case of An-Antef, king of Thebes (2000 B.C.), now in the Brit. Museum, is an example of Egyptian gilding that is comparable with the best modern work. It was practised by the potters and decorators of anc. Greece and Rome. In the *Odyseey* Homer describes how cattle were prepared for sacrifice by having their horns gilded with beaten gold. From Pliny the Elder has come down the earliest account of gold-beating, the craft appearing in Romo c. 100 B.C., when the exterior ornaments of the Capitol were gilded, form of decoration that was soon adopted for other public buildings and villas. A Ger. monk of the twelfth century outlines a process of gold-beating almost identical with that of to-day, and in the days of their prosperity the skilful Florentines were famous for the art. At least seven years of regular practice are necessary to attain moderate efficiency. The gold is alloyed with silver or copper, and is then cast into ingots, about 5 in. by 1 in. by $\frac{1}{4}$ in. thick. Powerful steel rollers flatten the ingots out to a 120-ft. ribbon 1 to $\frac{1}{4}$ in. wide and $\frac{1}{100}$ in. thick. The metal is now ready for the gold-beater. After annealing the ribbon is divided into pieces, each weighing about 6*½* grains, and from this point in its processing, the gold is untouched by hand, being manipulated by boxwood pincers. These pieces are interleaved in a 'cutch,' the interleaving being effected with small sheets of vellum or tough paper about 4 in. square. The cutch or pile is set on a firm marble or granite block supported by a heavy wooden post set in the ground to overcome vibration, and beaten with a seventeen-pound hammer until the gold has spread to the size of the paper screens. The art of beating the cutch consists in striking evenly over the whole square in such a way that the gold will always be even in thickness all over and the gold must extend without distortion of form. Each gold sheet is cut into four with a 'skewing' knife and again interleaved, this time in a 'shoder,' whose leaves are made of gold-beater's skin. The shoder consists of 800 gold-beater's skins about $\frac{1}{4}$ in. square. These skins are taken from the large intestines of oxen, their preparation being a jealously guarded secret; and it requires 500 oxen to supply enough membrane to make one shoder, which may, however, be beaten for months without the slightest injury. The shoder or packet is beaten for two hours with a ten- or twelve-pound hammer. Finally each G. L. is again divided into four and set between layers of very fine gold-beater's skin, in what is technically called a mould. Here the gold is beaten for the last time, usually for four hours. A seven-pound hammer is used. Twenty-five leaves, whic! are about 3*½* in. square, are sold together in a book, and the fineness of the metal is such that a grain of G. L. will gild 56 sq. in. of surface.

Goldmark, Karl (1830-1915), Austrian musical composer, b. at Keszthely, on the Plattensee; went to Vienna to study

music in 1844. In 1857 he gave a concert of his own works. His first opera, *Die Königin von Saba*, was produced at Vienna in 1875, and was followed by *Merlin* (1886) and *The Cricket on the Hearth* (1900). His descriptive symphony *Landliche Hochzeit* (1887) and some of his overtures—*Penthesilea*; *In the Spring*; *In Italy*—have had a great vogue. See his memoirs, 1912, and monograph by O. Keller, 1901.

Goldoni, Carlo (1707-93), It. dramatist, b. at Venice, and studied for the law, but early began dramatic writing. His first attempts were tragedies, among which were *Amasunta* and *Belisario* (1734). But he soon turned to comedy, and succeeded in creating a new school of comedy, based upon character and domestic life, in place of the old farcical type. Among his numerous plays are *Momolo Courtesan* (1738); *Il Prodigio* (1739); *La Bancarotta* (1741); *La Donna di Garbo* (1742); *L'Impostore* (1743); *Le Baruffe Chiozzotte* (1750); *Dama prudente* (1750); *Il Caffe* (1750); *Locandiera* (1753); *Il Bugiardo* (1760); *Todero Brontolon* (1761); *I Rusteghi* (1763); *Il Ventaglio* (1763); and *Le Bourru bienjaisant* (1771). A collected ed. appeared at Venice in 1788-1789, and a selection was trans. into Eng. in 1892. Later eds. of his complete works were pub. at Venico (1907) and Milan (1935). His letters, ed. by E. Nasi, were pub. in 1907. See E. Gimmioli, *La Poesia di Carlo Goldoni*, 1941. See also his own memoirs (1787) and lives by P. G. Molmenti, 1879; P. G. Galanti, 1883; C. Rabany, 1896; and H. C. Chatfield-Taylor, 1941.

Goldsboro, city of N. Carolina, U.S.A., in Wayne co., situated on the Neuse R., about 49 m. S.E. of Raleigh. The manufs. are knitted goods, cottons, lumber, furniture, and agric. tools. Fruit and vegetables are largely cultivated. Pop. 17,200.

Goldschmidt, Madame, see LIND, JOHANNA MARIA.

Goldsmith, Oliver (1728-74), novelist, poet, and dramatist, the son of a poor Irish clergyman, was b. at Lallas, Co. Longford, Ireland. One of a family of nine G. early became familiar with the struggle for existence which was to last throughout his life; he also learnt in his father's house that kindness, sympathy, unselfishness, and love of his fellow men which equally never left him. He was a dull and stupid boy, shy, and of unattractive personal appearance. He first managed to take his degree at Trinity College, Dublin, and then he spent the next three years verse writing, flute playing, making merry, teaching, perfectorily studying law in London and medicine in Edinburgh and Leyden. Then he set off on foot to make a tour of the Continent 'with a guinea in his pocket, one shirt on his back, and a flute in his hand.' Returning to London after two years he drifted into literature, writing for various magazines and compiling lists of Greece, Rome, etc. His papers to the *Bee* (1756) and his *Chinese Letters* (pub. under the title of *The Citizen of the*

World, 1762) brought him into notice. He made the acquaintance of Johnson and Reynolds and became a member of the famous Literary Club. His constitutional improvidence, reckless charity, and love of pleasure kept him on the verge of poverty all his life, but he never lost his humorous merriment and love of life. His increasing debts, however, hastened his end. Early in 1774 he was stricken with fever, which, aggravated by mental distress due to the poverty into which his improvidence had steered him, and by his use of quack remedies against medical advice, terminated fatally on April 4. A monument to him was erected in Westminster Abbey, with a Lat. inscription in eulogy of his works and character by his friend and champion Dr. Johnson.



OLIVER GOLDSMITH

His poem *The Traveller*, which established his position, deals with the conditions of various countries, and has an underlying philosophy. In 1760 he pub. his masterpiece, *The Vicar of Wakefield*, a story of simple, natural life, largely autobiographical. In it G. may be said to have readjusted the people's vision, in that he discarded the lengthy discussions, artificial form, self-analysis, and over-sentimentality, which characterised the novel up to his time and created life-like figures and found new motives outside the restricted sphere where novelists had hitherto sought their materials; he added the idyllic note. In his two comedies which still live and please, *The Good-natured Man* (1766) and *She Stoops to Conquer* (1773), there is a reaction against the false sentimentality of the time. *The Deserter's Village* (1770), a poem which still preserves its freshness, embodies the idea that a nation cannot be great unless each individual who helps to create its prosperity has a share in its blessings. G. started in this poem a line of thought which leads straight to the present-day

grappling with industrial problems. G. with his large humanity, pathos, and humour, helps, as Scott said, 'to reconcile us to human nature,' and Dr. Johnson pleads, 'Let not his frailties be remembered, he was a very great man.' See J. Forster, *The Life and Adventures of Oliver Goldsmith*, 1818; W. M. Thackeray, *English Humorists*, 1858; R. Crawford, *Oliver Goldsmith and Medicine*, 1914-15; T. Scott, *Oliver Goldsmith Bibliographically and Biographically considered*, 1928; and A. Tillotson, *Dr. Johnson and the 'Life of Goldsmith'*, 1933. See also lives by W. Irving, 1844; W. Black, 1878; A. Dobson, 1888; F. Moore, 1910; K. C. Balderston, 1926 and S. Gwynn, 1935.

Goldsmithe, one of the livery companies of the city of London. Mention of the G. among the adulterine crafts occurs about 1212, but their guild does not seem to have attained importance till about 1615, when they began to set up as bankers, being instrumental in the introduction of bills and paper currency. Their bills were even accepted by Parliament, but when the Bank of England was estab. after the revolution the company found itself unable to meet the competitors. The G. now stand fifth among the twelve great companies. They have been great educational benefactors and have presented a valuable collection of early books on political economy to the univ. of London. See W. Herbert, *History of the Twelve Great Livery Companies*, 1837; W. Hazlitt, *The Livery Companies of the City of London*, 1892; and C. J. Jackson, *English Goldsmiths and their Marks*, 1905.

Goldsmith's Art and Work. The working of the precious metals, and notably of gold, has been practised with considerable skill by man from very early times. The anc. Egyptians have left many remains of cloisonne work and moulded ornaments, in which they specially excelled, as well as numerous round plaited chains. The personal gold jewellery found in Egyptian sarcophagi, sometimes dating as early as 2000 B.C., includes necklaces, rings, bracelets, and hair ornaments. Both design and execution are excellent. Some of the work is inlaid with precious stones, and there are examples of filigree and of granulated gold work. Assyrian art gives plentiful evidence of the existence of the goldsmith's art among that people, but the actual remains hitherto discovered have been slight. The same may be said of Crete. Phoenician goldwork has been found in considerable quantities in Cyprus and Sardinia. Among its distinguishing features are delicate filigrees of gold wire on a gold ground, the use of grain ornaments, relief, and inlaid work, while the articles include all kinds of jewellery for personal adornment, as well as weapons, etc.

Early Gk. jewellery is chiefly of pure gold, usually beaten very thin and delicately ornamented with filigree or granulated work. Gk. filigree work from the sixth to the third century B.C. shows this art in its highest perfection. Other distinguishing features are fretwork, wave ornament, and the guilloche, and the work

is more notable for its exquisite workmanship than for any marked individuality in design and treatment. Etruscan gold-work is directly derived from the Gk., and at its best is scarcely distinguishable from it, being particularly good in filigree and granulated surfaces. The later Etruscan work is more florid and diffuse than good Gk. designs. Rom. jewellery is also mainly an imitation of Gk. forms, though it tends to the larger use of precious stones and of plain surfaces. The early Teutonic nations showed considerable skill in sev. kinds of goldsmith's work. Anglo-Saxon remains include jewels of many varieties which show filigree work, pierced gold sheets, cloisonné work, and



Ashmolean Museum

FACSIMILE OF REPOUSSE GOLD CUP WITH VERTICAL SPRAYS, FROM MYCENAE

beaded and twisted gold. Conventionalised animal forms are largely used. The Celtic peoples, notably the Irish, were skilful and artistic workers in gold. The Tara brooch is a very famous example of Irish work, which is distinguished by the use of filigree of curiously complicated knotted designs, hammered work with repoussé details and fillings-in of enamels, etc., and chased lines. In medieval times the goldsmith's art was highly honoured in all European countries, and, after the Renaissance, reached a very high state of perfection, particularly in Italy. Early medieval jewellery was mainly massive and simple in design; the later examples are largely in cast work, ornamented with enamels and precious stones, bosses, and borders of filigree. A famous Eng. example is the Burnley jewel. The art declined during the seventeenth and eighteenth centuries, the traditional forms being often combined with most incongruous effects, but a revival of goldsmith's work has lately begun, with excellent results. The preparation of the gold by alloying and colouring, and the manuf. of jewellery is largely carried on in Clerkenwell (London), Birmingham, Paris, Vienna, and Berlin. Some very delicate and beautiful work still comes from E. countries, notably from India. See J. Lessing, *Gold und Silber*, 1907; M. Rosenberg, *Geschichte der Goldschmiederei auf technischen Gründen*, 1910-25; S. J.

Churchill, *Goldsmiths of Italy*, 1926; L. Weaver, *Art in Industry and Salesmanship*, 1929; A. H. Lee, *Works of Art in Silver and other Metals*, 1936; and M. N. Morrison, *Silversmiths and Goldsmiths of Cape of Good Hope*, 1936.

Gold Standard, currency system under which bank notes may be exchanged for gold at any time at a fixed rate. There are three forms: full G. S.—the central bank is bound to redeem its notes in gold coin and also to buy and sell gold at a fixed price; gold bullion standard—no gold coins are in circulation and there is no redemption of notes, but the central bank is bound to buy and sell gold at a fixed rate (this was the Brit. system from 1925 to 1931); the gold exchange standard—the central bank does not buy and sell gold, but only drafts in foreign currencies on the gold or gold bullion standard. Free exportation and importation of gold, or free sale of foreign gold exchange is necessarily linked up with the G. S. See further under CURRENCY; ECONOMICS; MONEY.

Gold Stick, name of an officer in the royal household to whom the king in person gives the parole and countersign, and who reports directly to the king and the Army Council, as well as laying orders issued by the Army Council before the king. The office was instituted in the reign of William IV., and is held in rotation for periods of a month at a time by the colonels of the two regiments of household cavalry.

Goldstücker, Theodor (1821-72), Ger. Sanskrit scholar, b. at Königsberg. He became prof. of Sanskrit in the univ. of London. He worked on a Sanskrit dictionary, but his most important work was *Panini, his place in Sanskrit Literature* (1861). Owing to his efforts the Sanskrit Text Society was formed in 1866.

Goldwyn, Sam (b. 1882), Amer. film producer, b. at Warsaw, Poland, the son of Abraham Goldfish, he later took the name of G. He went to the U.S.A. in 1896 and started in the glove manufacturing business. He became a naturalised Amer. citizen in 1902. His entry into the film industry in 1913 was as an associate of Jesse Lasky and Cecil B. DeMille in Lasky Feature Photoplay. He afterwards became chairman of the Famous Players Lasky Corporation. In 1918 he resigned and formed the G. Pictures Corporation. His interest in this was sold in 1924 to Metro-G.-Mayer, and from 1927 to 1940 G. was director of the United Artists' Corporation. G. has a large number of highly successful productions to his credit, among which special mention should be made of *Stella Dallas* (1925); *Wheeler* (1930); *Wuthering Heights* (1939); and *The Best Years of Our Lives* (1946), this last receiving the Motion Picture Academy award. Indefatigable in his search for new talent, G. was responsible for introducing a number of actors and actresses to films who afterwards became celebrated.

Goléniew, or Gollnow, tn. of Poland, formerly of Prussia, situated in the prov.

of Poznan. It is about 15 m. N.E. of Stettin and is a small manufacturing tn. It is very old and was formerly a Hanse tn. Pop. 11,000.

Goletta, tn. on the gulf of Tunis, and connected with the city of Tunis by a canal and by rail. The importance of the tn. as a port has been diminished by the opening of the ship canal which connects with Tunis. It is well fortified. Stones from the ruins of Cartilage were used in the construction of many of its buildings. In 1535 Charles V. captured it from the Turks, by whom it was retaken in 1574. Pop. about 7000.

Golf, originally a Scottish game of great antiquity. Other variants of the name are *goff* and *gouff*, the last of which may be heard in Scotland, although *goff* has become fashionable in England. The name is probably derived from a Celtic form of the Ger. word, *Kolbe*, meaning club. The game, however, has some slight resemblance to the old Dutch game *kolf*, shown in some seventeenth-century Dutch paintings, but it is not known whether the game was introduced into Scotland from Holland. Certainly in the reign of James VI. of Scotland the Scots used to buy their balls and clubs from Holland, as James eventually prohibited their importation. G. was popular in Scotland as early as the fifteenth century, but its origin is suspected to be much older. In 1457 the Scottish Parliament, concluding the game was interfering seriously with the defences of the country, ordained that 'the fute ball and golf be utterly cryft down, and nocht usit; and that the bowmerkeris be maid at ilk paroche kirk a pair of buttis and schuttis be usit ilk Sunday.' Further enactments to this effect were passed during the fifteenth century, some of which show us clearly that the game, in spite of the laws, was becoming rapidly more popular every day. In fact, the king, James IV., whose enactments attempted to stop the game, nevertheless broke the law himself and played. G. is usually called the royal and anct. game, and there is much evidence to show that it was often played by Scottish royalty. James V. was a player of note; his daughter, Mary of Scotland, is also supposed to have played. James VI. of Scotland and I. of England is held by some authorities to have been a player himself; and from the evidence quoted above he may, at any rate, be held to have been a keen partisan of the game, whilst from his reign dates the origin of the oldest of all G. clubs, the Royal Blackheath Club (1608). The famous St. Andrews Club was instituted in 1754, and the Musselburgh G. Club in 1774. An earlier foundation is the Honourable the Edinburgh Company of Golfers, with a series of minutes dating from 1744. A silver club is competed for annually, and after 1891 the Honourable Company acquired the links at Muirfield. The St. Andrews Club took the title of the Royal and Anct. G. Club of St. Andrews by the wish of King William IV., who became patron in 1834, a patronage which was continued after his death by his queen, Adelaide. The King

William IV. gold medal, presented in 1837, is still competed for. G. began anew in England with the Westward Ho Club instituted in 1864, followed by the two Wimbledon clubs and the Liverpool Club with links at Hoylake. From the year 1880 G. seems to have thriven enormously, clubs have sprung up all over the country, and in fact at the present day it is wellnigh impossible to go to any part of the country without finding a G. course within easy distance. There are in the Brit. Isles about 2000 clubs, with an average membership of about 300. The game has spread not only in Great Britain and Ireland, but in all the dominions, and in America, especially in the E. states. G. has become popular on the Continent, especially in France, Germany, and Austria. The Royal and Anct. Club of St. Andrews is the governing power in G., and drew up the original rules of the game. In 1899 a standing committee was inaugurated by the St. Andrews Club representing golfing opinion in Great Britain. In the U.S.A. G. is controlled by the U.S. G. Association, and in Canada by the Royal Canadian G. Association. In England, Canada, and America there are also large professional golfers' associations. In America also each state has a G. association, while women's G. is cared for by similar women's G. associations. In the Brit. Isles there are the Ladies' G. Union and the Irish Ladies' Golfing Union. One feature of G. is that there is not the disparity between the amateur and the professional which marks some games. The chief G. championships are the open, the amateur, and the ladies'.

The open championship is played only on the following courses: St. Andrews, Prestwick, Muirfield, Hoylake, Sandwich, and Deal. The winners during recent years have been G. Duncan, 1920; J. Hutchinson, 1921; W. Hagen (U.S.A.), 1922; A. G. Havers, 1923; W. Hagen (U.S.A.), 1924; J. Barnes (U.S.A.), 1925; R. T. Jones, junior (U.S.A.), 1926 and 1927; W. Ilagon (U.S.A.), 1928 and 1929; R. T. Jones, junior (U.S.A.), 1930; T. D. Armour (U.S.A.), 1931; G. Sarazen (U.S.A.), 1932; D. Shute (U.S.A.), 1933; T. H. Cotton, 1934; A. Perry, 1935; A. H. Padgham, 1936; T. H. Cotton, 1937; R. A. Whitcombe, 1938; R. Burton, 1939; S. Snead (U.S.A.), 1946; F. Daly (Belfast), 1947; T. H. Cotton, 1948; A. D. Locke (S. Africa), 1949.

The amateur championship was instituted in 1886, the winners during recent years being C. Tolley, 1920; W. Hunter, 1921; E. W. Holderness, 1922; R. Wethered, 1923; E. W. Holderness, 1924; R. Harris, 1925; J. Sweetser (U.S.A.), 1926; W. Tweddell, 1927; T. P. Perkins, 1928; C. Tolley, 1929; R. T. Jones, junior (U.S.A.), 1930; E. Martin-Smith, 1931; J. de Forest, 1932; Hon. Michael Scott, 1933; W. L. Little (U.S.A.), 1934 and 1935; H. Thomson, 1936; R. Sweeney, 1937; C. R. Yates (U.S.A.), 1938; A. Kyle (Scotland), 1939; J. Bruen (Cork), 1946; W. T. Turnesa (U.S.A.), 1947; F. Stranahan (U.S.A.), 1948; S. M. McCready, 1949.

The winners of the Brit. women's open championship in recent years have been C. Leitch, 1920 and 1921; J. Wethered, 1922; D. Chambers, 1923; J. Wethered, 1924 and 1925; C. Leitch, 1926; S. La Chaume, 1927; L. Le Blan, 1928; J. Wethered, 1929; D. Fishwick, 1930; E. Wilson, 1931, 1932, and 1933; A. Holm, 1934; W. Morgan, 1935; P. Barton, 1936; J. Anderson, 1937; A. Holm, 1938; P. Barton, 1939; W. Morgan (unofficial), 1942; A. C. Critchley (unofficial), 1943; M. Ruttle (unofficial), 1944; G. W. Hetherington, 1946; M. Zaharius (U.S.A.), 1947; F. Stephens, 1948; F. Stephens, 1949.

tance of some 100 to 500 or 600 yds. distance from one another, and each hole is usually marked by a flag. The game is commenced by teeing the ball, i.e. by placing it in a position of advantage from which it can easily be driven, usually on the top of a small mound of sand. After driving the ball from the tee it must not again be touched by the hands or placed in any special position save as the rules of G. allow under special circumstances. The game now consists of playing the ball with one or other of the variety of G. clubs until it is putted into the hole, after which it is taken to the next tee and driven off again in the direction of the next hole. The use



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THE HOME OF GOLF: THE LIGHTLEATH GREEN AND THE CLUB-HOUSE OF THE
ROYAL AND ANCIENT GOLF CLUB OF ST. ANDREWS

Before the First World War the Brit. open championship was mostly in the hands of three professional players, J. H. Taylor, J. Braid, and H. Vardon. Taylor won the open championship in 1900, 1909, and 1913; Braid in 1901, 1905, 1906, 1908, and 1910; and Vardon in 1903, 1911, and 1914. Another famous golfer of this period was the Frenchman, A. Massy, who won the Brit. open in 1907 and tied with Vardon in 1911. G. Duncan, Abe Mitchell, Walter Hagen, R. T. Jones, and Henry Cotton were the most notable successors to those great players.

The Game.—Briefly the game consists in hitting a ball by means of clubs over a certain amount of country into a hole some 4 in. in diameter and about 6 in. deep. The final act of hitting the ball on the green into the hole is called putting. A course usually consists of either eighteen or nine holes, each of which are at a dis-

of a variety of G. clubs is necessary to surmount bunker, and also because the lie of the land is not always of a sufficient equality to allow of the continual use of the same club. It is to a very great extent this variety which gives so much charm to the royal and anct. game. At the end of the round that player is held to be winner who has succeeded in holing out in the least number of strokes on the most occasions. A game may, however, be decided before the round of the links has been actually finished, since if at the seventeenth tee a player is three to the good it is impossible for his opponent to win, and the score would be called three up and two to play. Since the game became popularised many changes have been made in the clubs used, the most notable being the introduction of steel shafts, and many additions have been made to them also. In the matter of balls used great

progress has been made, and the change from the gutta-percha ball to the ball with an india-rubber or soft core has done much to make the game easier for the casual player. It is impossible to give here a definition of all the technical terms used in G., but definitions of the prin. clubs used are as follows: A *baffy*, a short wooden club used for lofting; *brassey*, a wooden club shod with brass; *cleek*, an iron-headed club, which is used for driving through the 'fairway' and is capable of the largest drive of all iron clubs; *driver*, the longest driving club; *iron*, an iron-headed club used for driving or lofting; *mashie*, a short-headed iron club. The head of a lofting mashie is laid well back and is used for lofting short shots; *putter*, the club used for playing short shots near the hole, usually on the putting green. There are in almost every case different varieties of each of the clubs mentioned.

Golfing Terms or Slang.—'Birdie,' hole done in one under the par or bogey figure; 'bogey,' score that a good G. player should do hole or course in; 'bunker,' sand-pit; 'chip-shot,' short lofted approach; 'dormay' or 'dormic,' leading by as many holes as remain to be played; 'eagle,' hole played in two strokes under par or bogey; 'explosion shot,' 'dunting' the ball up into the air without the blade actually coming into contact with it; 'fairway,' smooth turf between rough; 'foozle,' bungle; 'fore,' warning people in way of shot or stroke; 'iron,' iron-headed club; 'par,' the number of strokes a scratch player should require for a (hole or) course (calculated according to a formula and usually less than the bogey figures); 'pitch-shot,' the usual shot if the green be soft (so that the ball can be played to alight on it and stop); 'sneeze,' stroke making ball curl to right; 'spoon,' club like brassey, but with more loft; 'stymie,' position on putting green when one ball lies between the other and the hole; 'topping,' hitting (ball) at top instead of true. See H. G. Hutchinson, *Golf* (Badminton Library), 1895; C. J. H. Tolley, *The Modern Golfer*, 1924; B. Darwin, *The Golf Courses of Great Britain*, 1925; A. Mitchell, *The Essentials of Golf*, 1927; H. Cotton, *Golf: A Short Treatise*, 1931, and *This Game of Golf*, 1918; P. Lawrie (editor), *The Golfer's Companion*, 1937; and H. Longhurst, *Golf*, 1937.

Golgotha, scene of the crucifixion of Christ, being a small hill just outside Jerusalem. It has been identified with a knoll on the N. side of the city, close to the Damascus gate, and was probably the place of public execution according to the Mosaic law. The Heb. word G. means a skull, but it is uncertain whether this refers to the shape of the hill or to the skulls of criminals which might be found there.

Goliad, vii. in the co. of the same name in the state of Texas, U.S.A. It is situated on the N. bank of the San Antonio. It is an important railway centre and has cotton mills and flour mills. It played an important part in the Texan War of Liberation. Pop. 2000.

Goliath, champion of the Philistines who

challenged the hosts of Israel to combat. David won renown by slaying this champion with a stone from his sling. This is the tradition given us in 1 Sam. xvii. Reference is made to another G. (2 Sam. xxi. and 1 Chron. xx.). In the latter this second G. is held to be a brother of the giant of the Philistines. Evidence, however, seems to prove that the story of David and G. is of late origin.

Goliath Beetle, found in tropical and S. Africa, is so called from its giant size, the male of the largest variety, *Goliathus druryi*, being as much as 4 in. in length. It is a lamellicorn beetle, belonging to the sub-family Cetoniidae, and to the genus of the Scarabaeidae. Its size and velvety-black hue, often diversified with white markings, make it a splendid insect.

Golitsuin, or *Golitzin*, see *GALITZIN*.
Golius, James (1596-1667), Dutch orientalist, b. at The Hague; studied Arabic and E. languages under Erpenius at Leyden. In 1622 he went to Morocco on a diplomatic mission, and in 1624 succeeded Erpenius at Leyden, where he occupied the chairs of Arabic and mathematics till his death. During 1625-29 he took a tour through Syria and Arabia. He wrote numerous works on oriental subjects, the chief being the *Lexicon Arabico-Latinum* (1653).

Gollancz, Sir Hermann (1852-1930), Jewish rabbi and Semitic scholar, b. in Bremen, brother of Sir Israel G. Educated at Univ. College, London, and prof. of Heb. there from 1907 to 1923. He was well-known for his philanthropy, and founded many synagogues in working-class areas. Preacher at the Bayswater Synagogue from 1892 to 1923. First rabbi to be honoured with a knighthood (1913).

Gollancz, Sir Israel (1864-1930), prof. of Eng. literature, was educated at the City of London School, Univ. College, London, and Christ's College, Cambridge. After a distinguished scholastic career he acted for ten years (1896-1906) as univ. lecturer in Eng. at Cambridge, and, till his death, held a similar post at King's College, London, where he was also dean of the faculty of arts. His *Cyneulf's Christ* (1892) and *Exeter Book of Anglo-Saxon Poetry* (1895) prove him an authority on old Eng. texts, whilst he also brought out the *Temple Shakespeare* (1894-96), and *Lamb's Specimens of Elizabethan Dramatists* (1893). He was director of the Early Eng. Text Society, honorary secretary of the Shakespeare Memorial Committee, and secretary of the Brit. Academy since its foundation in 1903. See a memoir by Sir F. G. Kenyon, 1932.

Golikow, see *GOLKNIOW*.

Golomyinka, unique fish, the only one of its species, which in some respects resembles the gobies and which is only found in Lake Baikal, E. Siberia. It exudes oil from every part of its body, has no scales, and is flabby to touch. Its scientific name is *Callyionymus baicalensis*, or *Comephorus*.

Golovnin, Vasily Mikhailovich (1776-1831), Russian sailor and vice-admiral,

was b. at Gulyntki, in the prov. of Ryazan. He was a great navigator and explored the coasts of Kamchatska and of Alaska. In 1810 he was captured and imprisoned by the Jap., and remained a prisoner until 1813. He then returned to St. Petersburg and planned the circumnavigation of the globe by a Russian ship. He was appointed to the command of the expedition and started in 1817, returning in 1819. He wrote, amongst other works, *Journey Round the World* and *Narrative of my Captivity in Japan* (1818). A completed ed. of his works was pub. at St. Petersburg in 1864, with a biography by N. Grech.

Goltz, Colmar, Freiherr von der (1843-1916), Ger. field marshal and military author, b. at Bielkenfeld, E. Prussia, son of Erhard W., Baron von der G. In Franco-Prussian war, 1870-71, general staff officer in Second Army. In 1871 in 8th Regiment, and became teacher in School of War, Potsdam. Taught war hist. at War Academy. In 1883 transferred services to Turkish Gov., for whom he conducted dept. of military education till 1896. Reorganised Turkish Army, 1908-1910. Field marshal, 1911. General inspector of 2nd Army Corps until retirement from army, 1913. When Gers. advanced into Belgium, Aug. 1914, G. became military governor of that country. In April 1915 took command of First Turkish Army in Mesopotamia, where he fought Gen. Townshend in Dec., and drove him back at Kut-el-Amara. D. at Turkish headquarters near Bagdad, April 19, 1916. Works include *Die Operationen der II. Armee bis zur Capitulation von Metz* (1874); *Léon Gambetta und seine Armen* (1877); *Das Volk in Waffen* (1883, sixth ed., 1925); *Krieg- und Herrschaftsleitung* (1901); and *Von Jena bis Preussisch Eylau* (1907). See life (with letters) by von Schmittenlow, 1925.

Goltzius, Heinrich (1558-1617), Dutch engraver and painter, b. at Mülbrecht, and after working for some years in Holland made a tour through Germany and Italy in 1590, returning for the rest of his life to Haarlem. His engravings show great technical excellence, and some of his portraits are very fine. Much of his work is a slavish imitation of Michelangelo, whom he greatly admired. See study by O. Hirschmann, 1919, 1921.

Goluchowski, Agenor, Count (1819-1921), Austrian statesman, descended from a noble Polish family. He entered the diplomatic service, and after being secretary to the legation at Berlin became Austrian minister at Bucharest (1837-93). In 1895 he became minister for foreign affairs. He upheld the Triple Alliance, brought about a better understanding with Russia, practically enforced neutrality during the trouble in the Balkans, and supported Germany in the Algeciras Conference (1905). He was, however, forced by Hungarian opposition to resign in 1900.

Gomal, see GUMAL PASS.

Gomarus, or Gomar, Franziskus (1563-1641), Protestant theologian, b. at Bruges, was educated in the faith of the Reformed Church in Germany, whence he after-

wards crossed to England and graduated at Cambridge Univ. He became prof. of theology at Leyden and opposed the teachings of Arminius. Owing to the victory of the views of Arminius, he forsook Leyden, and after an interval was appointed to the theological chair at Saumur. A posthumous work, *Lyra Davidis*, appeared in 1645. See monograph by G. P. van Iterzon, 1930.

Gomberville, Marin le Roy (1600-74), noted Fr. author of the seventeenth century. His great work *Polyzandre* appeared between 1632 and 1637. He was one of the earliest members of the Fr. Academy. Amongst his other works are *Le Théâtre moral de la vie humaine* (1678?), and *Moral Virtue Delineated*, (2nd ed.) 1726.

Gombo, see OCHRA.

Gombroon, see BENDER-ABRAS.

Gomel, tn. of the G Region of the Byelorussian S.S.R., situated 140 m. N.E. of Kiev and 100 m. S. of Mogilev, at the point where the railway from Minsk to the Ukraine crosses the R. Sozh, a trib. of the Dnieper. It has a regional power station which uses peat as fuel. At G. machinery for the cultivation, retting, and primary working up of flax is constructed. It has metal and wood-working factories and glass works, and a trade in timber and boat building. In their great counter drive on the E. front in the Second World War the Red Army crossed the Dnieper S. of G. on Sept. 17, 1943. On Nov. 25 the Russians launched an offensive S.E. of Mogilev and captured G. on the following day. Pop. (1939) 145,000. See also EASTERN FRONT or RUSSO-GERMAN CAMPAIGNS IN SECOND WORLD WAR.

Gomers, is. situated in the Atlantic, forming part of the Canary Is. group. Its area is 140 sq. m. The is. is very mountainous, and one of its chief industries is cattle rearing. Its chief port is San Sebastian. Pop. of whole is. 22,900.

Gomez, Diogo (fl. fifteenth century), Portuguese navigator and writer on discovery, was forgotten until his chronicle was pub. by Schmeller in 1847 from MS. in the State Library at Munich. In 1488 Prince Henry the Navigator equipped the *Wren* and two other caravels, with which G. sailed up the Gambia 'as far as Cantor.' G. was sent by King Alfonso in the same direction in 1460, when he explored the Cape Verde and Canary Is. G. had been made receiver of customs at Cintra in 1440. In 1466 he was made a judge in that place, and his office was confirmed to him in 1482.

Gomez, Juan Vicente (1856-1935), Venezuelan statesman and soldier. An Andino of mixed descent. He was the ruling force of Venezuela for over a quarter of a century, raising it from one of the lesser S. Amer. republics into a Caribbean power. He succeeded Cipriano Castro as president, and soon restored the country's financial position. In 1922 he agreed to accept office for a second term, but in 1929 refused to stand.

Gomm, Sir William (1784-1875), Brit. soldier, son of Lt.-Col. Wm. G., killed at Guadalupe in 1794. Fought in Holland

under the duke of York (1799), was with Wellington in the Peninsular war, and on Moore's staff at Corunna. Took part in most of the battles of the Peninsular war, and was one of the most trusted men of Wellington's staff. Served in the 5th Brit. Div. in the Waterloo campaign. See *Letters and Journals*, pub. by F. C. Carr-Gomm in 1881.

Gomme, Sir George Laurence (1853–1916), Eng. statistician and archeologist, son of Wm. Laurence G. of Hammersmith. Educated at the City of London School. At one time he edited the *Antiquary*, the *Archaeological Review*, and the *Folklore Journal*. His interest in old-time customs and superstitions was early awakened, and in such books as *Primitive Folk-Moots* (1880), *Chap-books and Folklore Tracts* (1885), and *Folklore as an Historical Science* (1908) he exhibited the results of his investigations. He founded the Folklore Society, and served it in many capacities—including that of president. He entered the service of the Metropolitan Board of Works at an early age and remained therein until its supercession by the London Co. Council with which he continued, being its clerk, 1900–1914. Besides those on folklore, pub. works on the hist. of London.

Gomorrah, see SODOM AND GOMORRAH.

Gompers, Samuel (1850–1924), Amer. Labour leader, b. at 11 Tenter St., Spitalfields, London, England; son of Solomon G., a poor Dutch Jew. In 1863 he emigrated to the U.S.A. and there worked at cigar-making. In 1864 he began to busy himself in developing the International Cigar-Makers' Union, of which he became secretary and afterwards president. Disapproval of the methods of the knights of labour led to his helping to found, in 1881, the Federation of Trades and Labour Unions, of which he was president for three years. When this organisation was merged in the new Amer. Federation of Labour, Dec. 1886, G. was elected president of the new body, and, with the exception of the year 1895, he held its presidency for the remainder of his life. He was opposed to socialistic theory and usually disapproved of 'Labour' politics—nevertheless in 1908 he tried unsuccessfully to throw the whole strength of the federation on the side of the Democratic party. In the First World War, he used all his influence to get the U.S.A. to side with the anti-Ger. powers of Europe. In 1919 he was elected president of the International Commission on Labour Legislation of the Paris Peace Conference. Later he was a member of the Advisory Committee to Amer. delegates to the Disarmament Conference, Washington. He wrote an autobiography, *Seventy Years of Life and Labour* (1925).

Gomperz, Theodor (1832–1912), Austrian classical scholar, b. at Brünn, son of Philipp G., banker. Studied at Brünn, and from 1849 under Bonitz at Vienna, where he was qualified lecturer 1867, prof.-extraordinary from 1869, ordinary prof. of classical philology 1873–1901. During the last-named period he became

widely known as a decipherer of inscriptions at Herculaneum. Works include *Philodemus Epicurei de ira liber* (1864); *Demosthenes der Staatsmann* (1864); *Herculaneum Studien* (1865–68); *Traumdeutung und Zauberei* (1866); *Neue Bruchstücke Epikurs, insbesondere über die Willensfrage* (1876); *Die Bruchstücke der griechischen Tragiker und Cobels neueste kritische Manier* (1878); *Herodoteische Studien* (1883); *Ein bisher unbekanntes griechisches Schriftsystem aus der Mitte des 4 vorchristlichen Jahrhunderts* (1884); *Zu Philodemus Büchern von der Musik* (1885); *Zu Heraklitos Lehre und den Überresten seines Werkes* (1886); *Über den Abschluss des herodoteischen Geschichtswerkes* (1886); *Platonische Aufsätze* (1887–1905); *Lebensbilder von H. Bonitz* (1889); *John Stuart Mill* (1889); *Die Apologie der Heilkunst. Sophistenrede* (1890); *Philodemus und die ästhetischen Schriften der herculanischen Bibliothek* (1891); *Die Schrift vom Staatswesen der Athener und ihr neueste Bearbeiter* (1891); *Die jüngst entdeckten Überreste einer den Platonischen Phaidon enthaltenden Papyrusrolle* (1892); and *Beiträge zur Kritik und Erklärung griechische Denker—Eine Geschichte der antiken Philosophie* (1893–1902) (Eng. trans., 1901–12). He ed. a trans. of Mill's collected works, Leipzig (1869–80).

Gonçalves Dias, Antônio (1823–64), Brazilian poet, b. at Caxias, Maranhão; educated in Portugal. Returning to Brazil in 1845 he at once began on dramatic and journalistic work, and in 1846 issued a vol. of lyrics, *Primeiros Cantos*. This was followed by *Segundos Cantos e sextilhas de Frei Antônio* (1848) and *Últimos Cantos* (1851). His lyrics are marked by patriotism, love of nature, and beauty of expression.

Goncharov, Ivan Alexandrovich (1812–1891), Russian novelist; studied much but wrote little, and, unlike most of the contemporary men of letters, was a conscientious bureaucrat, indifferent to all the political and socialistic propaganda of the revolutionists. For some time he held a position in the Ministry of Finance at St. Petersburg, and later (1856) visited Japan as Adin Putiatin's secretary, utilising his experiences abroad in *The Frigate 'Palada'*. Besides translating Schiller and Goethe, he pub., in 1847, his *Obukhovennaya Istorija* (A Common Story), but it is his novel *Oblomov* (1857) which has made his name illustrious. So vivid is the picture which he here gives of the idle lives of the landed gentry that Dobrolubov pronounced the country home of the Oblomovs to be 'our fatherland.' See A. A. Muzan, *Un Maître du roman russe*, 1914.

Goncourt, Edmond Louis Antoine Huot de (1822–96), and his brother, **Jules Alfred Huot de** (1830–70), Fr. men of letters, estab. a unique and lasting literary partnership. They were both endowed with a hyper-sensitivity to the minutest detail of existence, and a feverish and wholly extravagant conception of the influence of those details and of what may be called the purely physical and material environment upon the trend and bias of a

human life. Their theories as to novels and composition in general may be studied at length in the nine vols. of their *Journal* (pub. 1887-96), but the practical working of these theories may be best appreciated in their novels, especially in their masterpiece, *Madame Gervaisais* (1869). So personal and unsparing was the analysis of emotion and incident in this work that it may be considered with truth to have been written with their life-blood. Other of their joint productions in the sphere of fiction were *Sœur Philomène* (1861); *Renée Mauperin* (1864); and *Manette Salomon* (1865); whilst the older brother alone wrote *La Fille Elisa* (1878), which attained a remarkable popularity, and *Chérie* (1884). It is an apt similitude to speak of their novels as 'picture galleries hung with pictures of the momentary aspects of the world.' For they strove, not like Flaubert to present the grand unity which binds the most conflicting minutiae of daily life, but rather to depict the kaleidoscopic character which it possesses at the very moment of living, when the smallest things are magnified and there is none but the crudest perspective. Such an ambition entailed the most elaborate and lively knowledge of the period (the eighteenth century) about which they wrote, and this they procured by many years' untiring research into old letters, documents, and records, which but for their efforts would undoubtedly have remained in the oblivion into which they had already fallen. Their books, therefore, will be store-houses for the historians of the future, and the fineness of their miniature painting of the modes and manners of their chosen period, as it is displayed in *Portraits intimes du XVIII^e siècle* (1856-58), and *L'Art du XVIII^e siècle* (1859-75), etc., will long remain an object of wonder and admiration to their posterity as it was to their contemporaries. The brothers endowed a special Académie Goncourt that is to pub. their *Journal*; but 'so far very little has seen the light and it is to be feared, after two wars and much change, that the public may not be greatly impressed when the *Journal* does appear and reveals what many rather forgotten people did about 1870 or 1880' (Denis Saurat). The ann. prize of the Académie Goncourt, however, remains the greatest stimulus that can be given to the sale of a £1. r. novel. It is awarded for a novel by a young writer unlikely to receive encouragement from the Fr. Academy, and that the choice has often shown remarkable judgment is exemplified in the case of the award to Proust—then almost unknown—for *Les Jeunes en fleurs* (1918). See E. Zola, *Les Romanciers naturalistes*, 1881; P. Sabatier, *L'Esthétique des Goncourt*, 1920; M. Sauvage, *Jules et Edmond Goncourt*, 1932; and F. Fosca, *Edmond et Jules Goncourt*, 1941.

Gonda, tn. and dist. in the United Provs. India. The tn. is an important railway junction, and has a pop. of 15,800. The dist. has an area of nearly 3000 sq. m. and consists of a huge plain, which is remarkable for its fertility. Pop. 1,500,000.

Gondal, Indian native state now merged in Bombay prov. It has an area of 1024 sq. m. and a pop. of over 160,000. The main products are cotton and grain, and it has for long been noted as an extremely progressive state. It is connected with the sea-board by rail. The chief tn. is G., which has a pop. of nearly 20,000.

Gondar, cap. of the prov. of Dembea in Amhara, Abyssinia, 68 m. N.W. by N. of Debra Tabor, 25 m. N. of Lake Tsana, and situated at an average altitude of 6500-7500 ft. in rugged country. Formerly cap. of Abyssinia in succession to Axum. It was Basildes (who reigned from 1632 to 1635) who, after reasserting the royal power, built at G. a new cap. which was destined to remain the royal residence until the middle of last century. The tn. itself was built after the expulsion of the Jesuits. In the sixteenth century Father Paez, a Portuguese missionary, laboured for twenty years building churches, palaces, and bridges, some of which may be seen near G. to this day. In 1714, following a revolt of the army, David, son of Jesus, a king of the old Ethiopean house of Solomon, was restored to the throne and entered G. in triumph. James Bruce of Kinnaird (q.r.) visited it in its period of decadence, leaving in 1772 at a time of continual bloodshed, when Michael returned to G. as king. In 1848 Walter Chichele Flowden (subsequently murdered) visited G. where he concluded a trade treaty with Ali, ras of G. In 1851 King Theodore conquered G. and deposed the libertine John II., last of the titular emperors, and transferred his cap. from G. to Magdala. Near G. are the ruins of the fort of Gimp built by the Portuguese as a royal residence but burned by King Theodore. The architecture of its churches and mosques occasionally reveals European medieval influences. The pop. in the last century was 30,000 but has since then dwindled to 3000.

The Battle for Gondar (1941). With the capture of G. by Brit. and Abyssinian patriot forces at the end of Nov. 1941 the last It. stronghold in E. Africa fell. To all intents the fighting in It. E. Africa had come to an end six months previously. See ITALIAN EAST AFRICA, CAMPAIGN IN (1940-41). But some 25,000 troops or more, It. and native, who had been garrisoning G., reinforced by fugitives from the beaten and scattered It. armies, continued their resistance within this stronghold, and, the weather being unsuitable for campaigning, they were sealed up by besieging Brit. forces and left to be dealt with when conditions were suitable. It was on Nov. 27 that Gen. Nasu surrendered the G. fortress to Gen. C. C. Fowkes, commanding Brit. and allied forces. The battle took place in high mountainous country very favourable to the defence and averaging 6000 ft. above sea level. The Brit. and E. African troops fought magnificently. Attacking at dawn they turned the It. S. flank by midday and were pressing the attack round their rear. Highland, Indian, Sudanese, S. African, and W. African units, with small numbers of Free Fr.,

took part in preliminary operations, which involved an advance on G. from six converging points; but chief credit for the final battle must be accorded to Brit. E. African and Ethiopian patriot troops. By the time the final assault was delivered the enemy's air force had been reduced to one fighter and one bomber. In all 11,500 It. troops surrendered and 12,000 African levies. The Brit. forces were less than half the strength of the It. and sustained only light casualties. Some fifty guns and much other booty were captured.

Gondokoro, vil. of the E. Sudan, on the E. bank of the upper Nile. It is a gov. station, and its pop. is composed chiefly of Brit. military and civil officials, with a small number of natives. It is extremely unhealthy. It was named Imanilla by Sir Samuel Baker. It is practically at the end of the navigable course of the R. Nile, and owes to this fact much of its importance as a trading station.



Canadian Pacific

GONDOLAS ON THE GRAND CANAL, VNICE

Gondola, name given to the craft used since the eleventh century for the conveyance of people along the canals of Venice. (Is. are long, narrow, flat-bottomed boats, measuring 30 ft. by 4 or 5 ft., whose prow and stern rise high above the water and taper to a point. The gondolier stands on his *poppa* in the stern and skilfully propels the boat with graceful, broad sweeps of his single oar. Usually there is in the centre a *falsa* or cabin, low and curtained. Once the Gs. were gaily painted and decorated with oriental silks and rich embroideries, but since the sumptuary laws of the sixteenth century they have been quite black and altogether very different from the splendid craft of Carpaccio's pictures.

Gondomar, *Diego Sarmiento de Acuña* (1567-1626), Sp. diplomatist, began life as a soldier and in 1584 helped to beat off Drake from the coasts of Bayonne. From 1613 to 1618, and again from 1619 to 1622, he was Sp. ambas. in England, during which periods he boasted that he saved many Rom. Catholics from imprisonment and persecution, and undoubtedly was largely responsible for Raleigh's execution. By astute flattery he gained the goodwill of King James and exerted his whole influence in vain to further the Sp. marriage. See study by R. H. Lyon, *Gondomar*, 1910.

Gonds, The, Dravidian and aboriginal tribe of India, who to-day do not exceed 1,500,000, though once (from the sixteenth century to the invasion of the Mahrattas in 1741) they ruled a large tract of the central provs., which was named after them Gondwana. They probably arrived in India with the other Dravidians from the N.W., perhaps from the Iranian highlands at some very remote period. They are non-Aryans, but the upper classes are no longer a pure race, having intermarried freely with their Hindu neighbours. A Gond has a very dark skin, with black, curly hair; his skull is described as dolichocephalic, and his nose is flat and broad. Although many have adopted Hinduism the G. continue to propitiate the evil spirits which swarm in every riv., rock, and tree. The purer, simpler hill-tribesmen content themselves with a waist-cloth as the one article of dress, although the young folk are fond of adorning their bodies with all manner of trinkets.

Gonfalon (derived from Old High Ger. *gundfano*, war-flag), variously used in the Middle Ages for a banner or standard. Sometimes it was just a pennon fastened to the head of a knight's lance, but in religious processions and state functions it was a rectangular banner with numerous streamers. In Florence the 'gonfaloniere' were civic dignitaries.

Gongora, a genus of orchidaceous plants, contains well over one dozen species, all of which are epiphytic and occur in wild tropical America.

Góngora y Argote, *Luis de* (1561-1627), Sp. poet, b. at Cordova; studied law at Salamanca. His early works are marked by a truly poetic vein and a pleasing purity of style; they include ballads, odes, lyrics, and religious poems. Finding, however, that poetry afforded a poor livelihood, (l. became a priest in 1604, and proceeded to develop and elaborate a most affected and somewhat euphuistic style of composition. Thus his *Polifemo*, *Soldades* (Solitary Thoughts), and *Pyramo y Thisbe* are overlaid with stilted metaphors, grotesque Latinisms, and pompous phraseology, so much so that this new style was labelled Gongorism, or 'stilo culto,' in reference to its pedantic mannerisms. See M. Artigas, *Biografía y estudio crítico de don Luis de Góngora, y Argote*, 1925.

Goniometer (from Gk. *γωνία*, angle, and *μέτρον*, measure), instrument for measuring the angles between the faces of crystals.

There are two kinds—the contact G. and the reflection G. The former is used at the present day for the approximate measurement of large crystals. The latter is an instrument of great precision, and is used for the accurate measurement of the angles between the faces of small crystals. The faces must be smooth and bright so that they reflect sharply defined images of a bright object. By turning the crystal about an axis parallel to the edge between two faces, the image reflected from a second face may be brought into the same position as that formerly reflected from the first face. The angle through which the crystal has been rotated is the angle between the normals to the two faces.

Gonorrhœa, a definite disease of the mucous surfaces due to a bacillus, the *gonococcus*. It is classed as a venereal disease. G. attacks the young and innocent in various and manifold forms. The eyes of babies may be affected at, or a few hours after, birth. The eyes become red, inflamed, and weeping and unless energetically treated blindness for life may result. A large proportion of the inmates of asylums for the blind are furnished by these innocent victims. As G. is a contagious disease, should it obtain a footing in schools and institutions, a considerable number run the risk of being affected by the incidents of daily life. In later life it is apt to contaminate the blood and attack the joints, producing a particular form of rheumatism. It may affect the heart, causing ulcerative endocarditis, an extremely fatal complication. The lining of the brain, causing meningitis, or the substance of the spinal cord may be involved, the result of which is seen in an extremely rapidly progressing paralysis. The treatment of babies should be prompt and energetic, with the object of saving the sight, whenever the eyes are affected. Parents and nurses should at once report any trouble, so that the cases may be treated and the infection of others avoided. In older patients suspected cases should be promptly and skilfully treated until the disease is thoroughly eradicated.

Gonsalvo di Cordova, whose correct title was *Gonzalo Hernandez y Aguilar* (1453-1515), Sp. conqueror, was awarded a large estate as the result of the favourable treaty he concluded with Abu Abdallah, better known as Boabdil, king of the Moors, after a prolonged contest with Granada, the Moorish stronghold. In 1498 he was honoured with the title of duke of St. Angelo, because, with the co-operation of Ferdinand II. of Naples, he had effectively driven the Fr. out of Italy. In 1500 'El Gran Capitan,' as he was called, rescued Cephalonia and Zante from the Turks and gave them back to Venice, and finally in 1503, after many vicissitudes and some reverses, gained a conspicuous victory over the Fr. near the Garigliano, securing Naples and Gaeta to the Spaniards. His enemies did not allow him long to enjoy his viceroyalty of Naples, for he was early recalled home where he suffered neglect and some disgrace.

Gonzaga, name of a princely family in Italy, founded by Louis G. who was captain of Mantua, and who in 1328 murdered the tyrant of that city. His descendants ruled Mantua till 1708, when Ferdinand-Charles IV. of G. was deprived of the duchy of Mantua because he had assisted Louis XIV. in the War of the Sp. Succession. The last descendant in the direct line from Louis was Vincent II. of G., who became a cardinal. John Francis of G. (1394-1444) was the first marquess of Mantua, and Frederick II. of G. (1500-40) was the first duke. Frederick played a great part in hist., and it was he who annexed Montferrat, which was elevated to a duchy in the reign of William of G. (1536-87). One branch was estab. by a son of the Frederick II. mentioned above. Its members were dukes of Mantua, Nevers, and Montferrat until all but Mantua was sold by Charles III. of G. (1629-65) to Cardinal Mazarin. A second collateral branch ruled Guastalla from 1541, when the Emperor Charles V. gave it to Ferdinand of G. (1507-57), until 1746, when Queen Elizabeth of Spain took possession of the duchy during the reign of the foolish Joseph of G. The general policy of the Gs., many of whom were enthusiastic patrons of art and learning, was to support and promote the imperial interests. See S. Brinton, *The Gonzagas, Lords of Mantua*, 1927.

Gonzaga, Luigi, member of the Castiglione branch of that family, called also St. Aloysius (1568-91), received his education in Florence, Mantua, and Rome. Although entitled to the marquisate of Castiglione, he allowed his brother to adopt the title and in 1585 became a Jesuit. His death was due to plague, with which he became infected after his devoted ministrations to the sick during a serious epidemic at Rome. In 1621 he was beatified for his good works, and in 1726 he was enrolled in the canon of saints.

Gonzaga, Thomas Antonio (1747-93), Portuguese poet, b. in Oporto, but passed his boyhood at Bahia, where his father was a magistrate. Educated at home at the univ. of Coimbra, he returned to Brazil after some years' absence, and after holding public appointments at Villa Rica eventually (1786) succeeded his father as 'desembargador' of the appeal court in Bahia. On the eve of his marriage with Doña Maria de Seixas Brandão, for whom he had conceived a romantic attachment, he was arrested for alleged complicity in a republican conspiracy, and was banished for ten years to the coast of Mozambique, where fevers undermined his health and intellect. He is cherished as the Portuguese Petrarch, for his *Mariua de Dirce* breathes the strength and beauty of love story. This booklet, which has a pastoral setting modelled on Theocritus, is treasured by his compatriots almost as highly as the poetry of Camoens, and in the temple of erotic poetry has been set on a pinnacle higher perhaps than it intrinsically deserves.

Gooch, Sir Daniel (1816-89), Eng. mechanical engineer, b. at Bedlington in Northumberland. At the age of fifteen

he began to work at the Tredegar iron-works, Monmouthshire. In 1837 he was appointed locomotive superintendent to the Great W. Railway. In 1864 he interested himself in the laying of a telegraph cable across the Atlantic, for which he was created a baronet.

Gooch, George Peabody (b. 1873), Eng. historian, educated at King's College, London, and Trinity College, Cambridge, of which college he subsequently became an hon. fellow. After taking his degree he continued his studies in Berlin and Paris. His first book, *History of English Democratic Ideas in the Seventeenth Century* (1898), was based on much original material and showed the scrupulous regard for sources which was to characterise his later historical work. In 1906 he entered politics and became Liberal M.P. for Bath, retaining this seat until 1910. Returning to the study of hist. he traced the development of the scientific method in the work of modern historians, and in 1913 pub. his *History and Historians of the Nineteenth Century*. He became an authority in the diplomatic hist. and foreign policy of the modern period, and his extensive researches made his *History of Modern Europe, 1878-1919* (1923) one of the best books on the period. He also collaborated with Canon J. H. B. Masterman in the *History of British Foreign Policy*, pub. in 1917 for the Council for the Study of International Relations, a book which was valuable during the First World War for its objective defence of Brit. and condemnation of Ger. policy. This led to his undertaking the joint editorship with Sir Adolphus Ward of the *Cambridge History of British Foreign Policy, 1783-1919* (1922-23). His reputation as a skilled and scholarly editor was further enhanced by his work in collaboration with H. W. V. Temperley on the *British Documents on the Origins of the War, 1898-1914* (1926-29). As a parallel task he compiled a selected list of works on the war, entitled *Revelations of European Diplomacy* (1927), a work notable for its fair-minded comment. During this very productive period he also took over the editing of the correspondence of Lord John Russell (2 vols., 1925), which had been begun by Lord Russell's son, who d. before the work was completed. Writing for a more general public he has contributed two vols. to the Home Univ. Library, *Political Thought in England from Bacon to Halifax* (1914) and *History of Our Time, 1855-1914* (1946), and also a book on Germany (1924) to the 'Modern World' series. He was president of the Historical Association, 1922-25, and of the National Peace Council, 1933-36. His position as a Ger. scholar is shown by his presidency of the Eng. Goethe Society. He was granted the award of C.H. in 1939, and holds the hon. degrees of D.Litt. at Durham and Oxford Univs. In addition to the works already mentioned he has written a number of other books, among which are *Germany and the French Revolution* (1920); *Before the War, Studies in Diplomacy* (2 vols., 1936); *Studies in Diplomacy and Statecraft* (1942); *Courts*

and Cabinets

(1944); *The German Mind and Outlook* (1945); *Frederick the Great* (1947); and *Studies in German History*, 1949.

Good, John Mason (1764-1827), Eng. physician and author, b. at Epping in Essex. In 1784 he practised as a surgeon but moved to London in 1793, with the view of obtaining literary employment. He pub. various poems, trans., and professional treatises. Among the trans. are *The Song of Songs*, from the Heb. (1803), *The Nature of Things*, from Lucretius (1805), and *The Book of Job* (1812). See O. Gregory, *Memoirs of the Life, Writings, and Character of the late J. M. Good*, 1828.

Good Conduct Pay, additional pay granted to privates, second corporals, and bombardiers in the Brit. Army for good conduct, as proved by the absence of entries in the regimental defaulters' book. One extra penny per diem is granted after two years' service without an entry, a second after six years, a third after twelve, a fourth after eighteen, and others at intervals of five years. Each penny is awarded together with a good conduct badge, to be worn on the left sleeve. One badge and penny is forfeited for each entry in the defaulters' book, and all are forfeited by desertion or offences calling for court martial.

Good Fellow, Robin, see PUCK.

Good Friday, name applied by the Rom. Catholic and Anglican Churches to the Friday before Easter, sacred as commemorating the anniversary of the Crucifixion. The word most likely arose from 'God's Friday' originally. In the Rom. Church the ritual is marked by many special features: the altar and priests are vested in black; a wooden clapper is substituted for the bell at the elevation of the host; the priest recites a prayer for all classes, orders, and ranks in the church, and even for heretics, pagans, and Jews. Then follows the 'adoration of the Cross.' The black covering is removed from the crucifix, and the entire congregation approach, and upon their knees kiss the feet of the figure. In the Gk. Church the fast is very strictly kept. In the Lutheran Church the organ is silent. The Anglicans hold a three hours' service, consisting of prayers and addresses on the 'seven last words from the Cross.'

'Good Hope,' name of a Brit. cruiser of 14,000 tons which was launched in 1901 at Fairfield.

Good Hope, Cape of, see CAPE OF GOOD HOPE.

Goodrich, Samuel Griswold (1793-1860), Amer. author, whose pen-name was Peter Parley. He ed. an annual called *The Token* from 1828 to 1842, to which he contributed tales, poems, and essays. Most of his publs., of which there are over 200, were written for the young, and deal with hist., geography, travels, and natural hist. Many of his books became popular in Great Britain. See his *Recollections of a Lifetime*, 1857.

Goodrich, vil. of Herefordshire, England, on the Wye, 3 m. S.W. of Ross. It has a ruined castle, a good example of the Norman border style.

Goodsir, John (1814-67), Scottish anatomist, b. at Anstruther; he studied at St. Andrews Univ., from where he served an apprenticeship to a dentist. In 1839 he pub. an essay on the teeth, and the next year he became keeper of the museum of the Royal College of Surgeons. His important memoirs on secreting structures and on the human placenta are still of value. He gained a wide reputation as an anatomical teacher in the univ. of Edinburgh. See W. Turner, *Memoirs*, 1868.

Goodwill, advantage or benefit acquired by an estab. or business beyond the mere value of the capital stock-in-trade, and funds employed in it, which it receives from constant or habitual customers, whether by reason of the quality of the goods sold, the local position of the estab., the skill, reputation, or personality of the proprietor, or any other reason that popular favour may assign. It is the expectancy of the continuance of such advantage or benefit that constitutes the market value of G. In the absence of express stipulation the transfer of G. leaves the vendor free to compete with the purchaser of his business, provided he does not hold himself out to be still carrying on the old business. It is a settled principle of law that upon the sale of G., the vendor must not solicit the old customers to cease dealing with the purchaser, but he may deal with such persons if they choose to come to him unsolicited, and the vendor may publicly advertise his business. Where a partnership is being dissolved, any partner may require that the G. may be sold together with the other partnership assets, and he may restrain the other partner or partners from doing anything in the meantime to prejudice the value of the G., as, for example, by using the partnership name. G. may be mortgaged, assigned, or taken in execution (q.v.), except where merely personal, as where it is constituted by the ability and skill of the proprietor.

Goodwin, John (c. 1594-1665), Eng. nonconformist divine, b. in Norfolk and educated at Queen's College, Cambridge. From 1633 to 1645 he was vicar of St. Stephen's, Coleman Street, but was rejected from this living for attacking Presbyterianism, and set up an independent congregation. In 1649 he issued a pamphlet *Might and Right Well Met*, in which he upheld Cromwell's army against the Parliament. He also wrote *Anti-Cavalierisme* (1642), *Redemption Redeemed* (1651), and the *Triumvir* (1658). See life by T. Jackson, 1822.

Goodwin, Thomas (1600-80), Eng. divine of the later Puritan period, b. at Rollesby, Norfolk, studied at Cambridge, and became a fellow in 1620. In 1625 he was licensed a preacher of the univ., and three years later became lecturer of Trinity Church, Cambridge, and was presented the vicarage by the king in 1632. Harassed by the interference of his bishop, he resigned his living and retired to Holland, where he was a pastor to the Eng. church at Arnhem. In 1640 he returned to London and ministered to a small congregation in St. Dunstan's-in-the

E., where he rose to considerable eminence as a preacher. In 1643 he was elected a member of the Westminster Assembly, and frequently preached before the House of Commons by appointment. He rose high into favour with the protector, and ultimately became somewhat prominent among his more intimate advisers. Five volumes of his works were pub. at London (1682-1704).

Goodwin Sands, range of exceedingly dangerous shoals in the straits of Dover, extending off the S.E. coast of England, co. of Kent, about 7 m. E. of Deal. Large level patches of sand are left dry when the tide recedes and afford a firm foothold, so that cricket has often been played upon them. When covered the sands are shifting and may be moved by the prevailing tide to such an extent as to change considerably the form of the shoal. The roadstead, termed the Downs, lies between them and the mainland. In length they extend for about 10 m. The shoal is divided into two prin. parts, N. and S., between which is the deep inlet of Trinity Bay. A great number of wrecks have taken place on these dangerous shoals, among the most notable the loss of thirteen men-of-war in one night. Near here the Dutch won a naval victory over the Eng. in 1652.

Goodwood, seat of the duke of Richmond and Gordon in Sussex. Its park is famous for cedars and other trees, which in 1751 included thirty different kinds of oaks and 400 different Amer. trees and shrubs. Racing was estab. in 1802, but its importance (since 1825) was due to Lord George Bentinck's exertions. The races are held annually in the park during the last week of July.

Goodyear, Charles (1800-60), Amer. inventor, b. at New Haven, Connecticut. As an iron manufacturer he failed in 1830, but he next turned to India-rubber. After suffering great poverty and ridicule he patented, in 1844, a process of vulcanising rubber. This process he later perfected until he required sixty patents to secure his inventions. He received medals in London (1851) and Paris (1855), as well as the cross of the Legion of Honour. See Pierce, *Trials of an Inventor*, 1866, and J. Parton, *Famous Americans of Recent Times* (Boston), 1867.

Googe, Barnaby (1540-94), Eng. poet, b. at Alvingham, Lincoln. He studied both at Christ's College, Cambridge, and at New College, Oxford, then travelled on the Continent, joining on his return his relative, Sir Wm. Cecil, and becoming one of the gentlemen pensioners of Queen Elizabeth. He was a friend of George Turberville and imitated his style and the metres of his poems. His best-known works are a series of eight elegies and his *Cupid Conquered*. A collection of his works was pub. in 1871 by Edward Arber.

Goole, tn. in W. Ridings, Yorkshire, on the R. Ouse. It is one of the chief riv. ports in the United Kingdom, and possesses extensive docks. In 1938 the tonnage of ships entered and cleared was respectively, 510,000 and 596,000. The chief exports are coal, stone, machinery, woollen

goods, and cotton. The prin. industries are the manuf. of alum, sugar, rope, and agric. implements. Shipbuilding is also carried on and there is a large dry dock. Steamship services to European ports are worked in connection with the railway. Pop. 18,300.

Goorkhas, see GURKHAS.

Goose, name given to all the birds belonging to the genus *Anser*, of the Anatidae, or duck family; there are about twelve species, which occur in the Nearctic and Palearctic regions. They are characterised by a slightly hooked beak, high at the base, short webbed feet, and legs placed further forward than in the case of other Anatidae. Geese live entirely on grass and other herbage, and are more at home on land than on water, as they swim very little and never dive. *A. canadensis*, the graylag G., is the only species which nests in Great Britain, and is the parent of the domesticated breed; it is found in the W. of Scotland and in the central cos. of Ireland. *A. albifrons*, the laughing G., *A. septentrionalis*, the bean G., and *A. brachyrhynchus*, the pink-footed G., are among the species which travel to Great Britain. Geese were domesticated at an early age, and are valued for their quills and feathers as well as for their flesh. Large numbers are bred in Lincolnshire, and more are imported from Holland and Germany. Strasburg geese having the widest reputation. Embden geese, remarkable for their whiteness, and Toulouse geese, are two of the best known domesticated varieties.

Goose, Barnacle, see BARNACLE GOOSE.

Goose Bay, air port and base at the head of Hamilton Inlet, Labrador. Its construction was undertaken by the Canadian Dept. of Transport at a cost of 15,000,000 dollars. Work on it was begun during the winter of 1911, and the base was in operation late in 1912. By the spring of 1913 it was servicing 100 planes every twenty-four hours for flights to Europe, being the prin. base of the Ferry Command. The building of the airport was a remarkable engineering feat; great runways and aerodromes were estab., power stations, engineering shops, barracks, entertainment and hospital buildings were erected, and roads laid out through the country over which formerly travelling was impossible in winter except on snow-shoes and skis. G. B. in fact soon became a self-contained tn. with its own waterworks, church, cinema, and defence system. It held a bastion against air attack from Ger. planes via Iceland, Greenland, and Labrador, and the execution of the project was expedited as a countermove to the Ger. plot, which had been worked out in detail in the school of geopolitical science in Berlin, to carry out the invasion of Canada from Norway. It was leased to Canada by the Newfoundland Gov. for ninety-nine years, the lease to expire on the termination of hostilities. See W. G. Carr, *Checkmate in the North, 1945*.

Goosberry, or *Ribes grossularia*, species of Saxifragaceae, closely allied to the red, black, and flowering currants. It is

indigenous to Britain and other European regions of cool temp., as well as to N. America and W. Asia. The name G. is supposed to have arisen from the fruit having been made into a sauce and used for young geese. The shrubby plant is very largely cultivated in Britain for its acid fruits, and it is usually propagated by means of cuttings. It is very hardy, and with good pruning and exposure to the light, it will grow in almost any garden; the flavour is best, however, where the low temp. of the N. brings the fruit more slowly to maturity than is the case in the S. The Cape G. is a species of Solanaceae, known in botany as *Physalis peruviana*, and it bears also the popular names of strawberry tomato and G. tomato.

Goose-fish, popular name for *Lophius piscatorius*, the angler fish.

Goose Grass, see CLEAVERS.

Goose, Solan, see GANNET.

Goossens, Eugène (b. 1893), Eng. conductor and composer, b. in London, son of Eugène G., a Belgian b. in France and long settled in England. Won a scholarship at the Liverpool College of Music in 1906 and studied under Sir Charles Stanford at the Royal College of Music, London. Played in Sir Henry Wood's orchestra and in the Philharmonic string quartet. Between 1915 and 1920 associated with Sir Thomas Beecham. First notable appearance as a conductor in 1916, when he directed Stanford's *The Critic*. In 1921 he formed his own orchestra, and as a conductor was afterwards associated with many famous orchestras in England and America. As a composer he first attracted attention in 1915 with *Five Impressions of a Holiday*, a trio for piano, flute, and cello. This was followed in 1916 by the *Rhapsody* and two sketches, *By the Turn and Jack o' Lantern*, which are his most frequently played works. Often changed his style, as with the *Kaleidoscope* (1918) and the symphonic poem *The Eternal Rhythm* (1920), but critics point out that the changes are temperamental rather than methodical. His harmonic sense is keen and his style generally is European rather than Eng. His works also include interesting chamber music and the operas *Judith* and *Don Juan*.

Gopher (*Testudo polyphemus*), land tortoise occurring in the S. states of America. It does great damage to potato crops, upon which it feeds; the flesh is considered excellent eating. G. is more commonly applied to certain small rodent mammals.

'Gopher State,' see MINNESOTA.

Goppingen, tn. of Wurttemberg-Baden, Germany. It possesses a castle, built partly with stones from the ruined castle of Hohenstaufen, a mineral spring, and many manuf., machine shops, and tanneries. Pop. 22,000.

Gorakphur, dist. and tn. of United Provs. of Agra and Oudh, India, bounded on the N. by Nepal and on the S. by Gogra R. The dist. (area 4578 sq. m.) is intersected by numerous rives, and lakes well stocked with fish. The tiger is found in the N., and many other wild animals abound. The chief production are cotton

and rice. Buddha d. within the dist. of G., and it became the headquarters of the new creed. During the mutiny of 1857 it was lost to the Brit. for a short while, but under the friendly Ghurkhas the rebels were driven out, and the whole dist once more passed under Brit. rule until 1947. Pop. tn. 72,000; div. (1853) 1,816,000, (1872) 2,019,000—a large increase in so short a time—(1930) 6,720,000.

Gorbals, suburb of Glasgow, lying S. of the Clyde. Until 1846 it was a separate municipality; now a burgh parl. constituency. It is a poor and crowded part of the city.

Gordobus, or *Ferrer and Porrex*, the earliest regular Eng. tragedy, written in collaboration by Thomas Suckville, Thomas Norton, and Lord Buckhurst, and played before Queen Elizabeth on Jan. 13, 1561, by the gentlemen of the Inner Temple hall. It was pub. in 1565 and again in 1570.

Gorshakov, or **Gortchakov**, Russian family of noble and anct. descent:

Prince Andrey Ivanovich (1768–1855), famous general of the Russian Army, who played an active and important part in the final Napoleonic campaigns.

Alexander Ivanovich (1769–1825), celebrated for the part which he played in the wars with Turkey and later against Napoleon.

Peter Dimitrievich (1790–1868), served in the later campaigns against France. He was afterwards of great use to the Russians in quelling the revolts in the Caucasus, and in the war of 1828 he fought against the Turks. When the Crimean war broke out he offered his services and was present at the battles of Alma and Inkermann.

Prince Mikhail Dimitrievich (1795–1861), brother of Peter. When war broke out with Turkey in 1853 he was made commander-in-chief of the Russian forces in Moldavia and Wallachia, afterwards commanding the Russian forces in the Crimea. He conducted the defence of Sebastopol with great skill. In the following year he became governor of Bland, where he d.

Prince Gorchakov Alexander Mikhaylovich (1798–1883), Russian statesman. Received a sound education in Russia, and on the completion of his education entered the Foreign Office. He early distinguished himself in diplomatic circles and quickly became the leading Russian diplomat. He was appointed Russian minister in 1850, when the Ger. confederation was formed, and was next sent as minister to Vienna. He was at Vienna during the Crimean war. He counselled the ending of that war when he saw that Russian objects could not be gained by prolonging it, and he shortly afterwards became minister for foreign affairs. His attitude as minister was bold and firm, and he was rewarded by being made chancellor of the empire. An understanding between Russia and Prussia now gave the Prussians their opportunity of becoming omnipotent in Germany and of crushing France. He now aimed at regaining for Russia what she had lost by

the treaty of Paris (1856), and by the treaty of San Stefano seemed to have done so, but the congress of Berlin caused Russia to make many concessions. He resigned for Russia, however, Bessarabia which she had previously lost.

Gordian Knot, see **GORDIUM**.

Gordianus, Marcus Antonius Africanus (A.D. 158–238), Rom. emperor. He was the son of Metius Marcellinus, through whom he traced his descent from Trajan. He governed Africa for many years as proconsul, and at the age of eighty was proclaimed emperor by the troops who had rebelled against the tyrannical rule of Maximinus. His young son was killed in battle, and G., overwhelmed with grief, committed suicide at Carthage after a reign of two months.

Gordianus, Marcus Antonius Pius (A.D. 238–44), Rom. emperor, the grandson of the above, was b. about 226. He was proclaimed emperor by the troops after the murder of Balbinus and Pupienus. He defeated the Goths in Moesia and waged war against Sapor, king of Persia, from whom he captured many cities. He was assassinated in Mesopotamia by Misitheus, his father-in-law and chief general.

Gordium, anct. city of Phrygia near the Sangarius on the Persian 'royal road' from Pessinus to Ancyra. It was here that, according to legend, Alexander the Great cut with his sword the G. knot which bound the yoke to the pole of the wagon of Gordius, the peasant king of Phrygia. This act was supposed to fulfil a prophecy which declared that whosoever should undo the knot would be king of all Asia.

Gordon, name of a famous Scottish family called after the lands of G. or Gordon in Berwickshire, and tracing its lineage to the thirteenth century. The first dependable traces of the family belong to the fourteenth century, when Sir Adam, in whom were united the G. and Huntly branches of the original family, took a prominent part in the struggle for independence. Sir Adam at first sided with the Eng., but after the battle of Bannockburn he joined the party of Bruce and was rewarded for his adherence with the lordship of Strathbogie in Aberdeenshire. Thus the chief seat of the family was transferred from Berwickshire to Aberdeenshire. Sir Adam had two sons, Adam and Wm. From the younger son Wm. sprang the Galloway, Irish, and Virginian branches of the stock. The elder, Adam (i.), was killed at Homildon Hill in 1403, and so brought the direct male line to a close; but two other grandsons (of illegitimate birth) continued the tradition, viz. Jock of Scudargue (d. 1394), illegitimate son of Sir John of G., from whom the earls of Aberdeen claim descent, and Tam of Ruthven, from whom many of the N. families are derived. Though the direct male line was brought to an end in 1403, Sir Adam left a daughter, Elizabeth. Elizabeth married Sir Alexander Seton and inherited the barony of the G. and Huntly lands in Berwickshire and the barony of the G. lands in Aberdeenshire. From this marriage sprang the Seton-Gs. or the dukes of G. Their

son Alexander was made earl of Huntly in 1445 and subsequently lord of Badenoch. By marriage he fell heir to the baronies of Cluny, Aboyne, and Glenmuick. He was succeeded by his second son, George, who married the daughter of King James I, and who acquired the lands of Schivas, Boyne, Enzie, and Netherdale. The third successor to the title was his son, Alexander, who augmented his territories by the lands of Strathaven and the brae of Lochaber. He fought with distinction at Flodden. The fourth earl was his grandson George, who fell heir to the earldom of Moray. He thus became the wealthiest and most powerful of Scottish landowners—so powerful that the sovereign, fearing usurpation, deprived him of the earldom of Moray. The earl, incensed, headed an insurrection, but was defeated and slain at Corrichie in 1562. His son George succeeded as fifth earl, and was in turn succeeded by his son George as sixth earl, a champion of Catholicism. He worsted the king's forces at Glenlivet, but was granted pardon and created marquess of Huntly in 1599. His son George, the second marquess, was a fervent royalist and was executed at Edinburgh in 1649. His son Lewis, the third marquess, was reinstated by Charles II. George, fourth marquess of Huntly, was created duke of G. in 1681. A Catholic by persuasion he was appointed by James II. keeper of Edinburgh Castle. He submitted to George I, but being suspected of Jacobite sympathies was forced to reside on parole in Edinburgh. He was succeeded by his son Alexander, the second duke, who associated himself with the Old Pretender but was pardoned on his surrender of G. Castle in 1716. He d. in 1728 and was succeeded by his son Cosmo George as third duke, who d. in 1752. Lord Lewis G., his brother, was one of the chief promoters of the Jacobite rebellion in 1745. Another brother was Gen. Lord Adam G., who was commander of the Scottish forces in 1782 and governor of Edinburgh Castle in 1786. Cosmo George, the third duke, left three sons. Alexander, the eldest and the fourth duke, is remembered as being the author of the popular song, *Cauld Kail in Aberdeen*; the youngest, Lord George, (q.r.), was leader of the 'No Popery' riots of 1780 and d. in Newgate in 1793. Alexander, the fourth duke, had married the beautiful Jane Maxwell, known as the 'beautiful duchess of G.', and their son George succeeded as fifth duke. The fifth duke raised the famous corps now called the second battalion of the G. Highlanders. He d. without issue in 1836, and the title with the earldom of Norwich and the barony of G. Huntly became extinct. The title of marquess of Huntly passed to his cousin and heir-male, George, fifth earl of Aboyne. Lady Charlotte G., daughter of the fourth duke and wife of Charles Lennox, fourth duke of Richmond, had a son Charles, who became heir to the estates and called himself G.-Lennox. Elizabeth, duchess of G., widow of the fifth duke, was a woman of great strength and sweetness of character. The dukedom of G. was

revived in 1876 in favour of the sixth duke of Richmond, who became duke of Richmond and G. George, the sixth earl of G., and first marquess of Huntly, left a second son, George, who became viscount of Melgund and Lord Aboyne (1627). On his death the title of viscount of Aboyne passed to his older brother George and subsequently to his son, Lord James, a fervent royalist. The title then passed in 1666 to his younger brother, Lord Charles G. George, fifth earl of Aboyne, was also ninth marquess of Huntly. His eldest son Charles was tenth marquess and he in turn left a son, Charles, the eleventh marquess. The earls of Sutherland are also a branch of this family. Adam G. of Aboyne (d. 1537) acquired the title of earl of Sutherland by his marriage with Elizabeth, countess of Sutherland. From this marriage sprang the G. earls of



GEORGE GORDON, SECOND MARQUESS OF HUNTRY

Sutherland, who retained the surname G. till the eighteenth century, when they revived the original surname of Sutherland. Of the branch of the G. earls of Aberdeen, Sir John G. of Haddo was made a baronet of Nova Scotia, and after him is named Haddo's Hole, of St. Giles's Church, Edinburgh, where he was imprisoned. His son, Sir George G. of Haddo, was raised to the peerage in 1682 with the titles of earl of Aberdeen, viscount of Fornantine, Lord Haddo, Methlic, Tarves, and Kellie. See J. M. Bulloch, *The House of Gordon*, 1903-7.

Gordon, Adam Lindsay (1833-70), Australian poet, b. of Scottish parents in the Azores at Fayal. In 1853 he entered the service of the S. Australian mounted police. He led an adventurous and unsettled life, impatient of steady occupation. Two vols. of poems pub. in 1867, *Sea Spray and Smoke Drift* and *Ashtaroth*, brought him into prominence. These were followed in 1870 by *Bush Ballads and Galloping Rhymes*, but in the year of its pub. G. committed suicide. In 1934 a memorial was erected to him in Westminster Abbey. See also AUSTRALIA, Literature. See The A. L. Gordon Memorial Volume (Melbourne), 1926, and D. Sladen, *Adam Lindsay Gordon*, 1934.

Gordon, Alexander (1692?–c. 1754), Scottish antiquary, b. probably in Aberdeen, where he became M.A., taught languages and music, and painted portraits. Acquired knowledge abroad—Fr., It., art, antiquities. After 1720 toured Scotland and N. of England, examining Rom. remains; results pub. in 1726 as *Itinerarium Septentrionale*. In London issued lives of popes and Fr. kings; made trans. and additions to the *Itinerarium* (1731–32). In 1736 secretary to Society for Encouragement of Learning and to Society of Antiquaries. Became also secretary to Egyptian Society.

Gordon, Arthur Hamilton, see STANMORE, BARON.

Gordon, Charles George (1833–85), known as 'Chinese G.', the hero of Khartoum, was b. at Woolwich, Kent. He was present at the assault of the Redan (1855) in Crimea. In 1866 he joined the expedition in China where the Taiping rebellion was ripe. The Russians were pushing their frontiers on the Amur and Ussuri; the Moslems in Yunnan and the Turkestan regions were insurgent. The Chinese Empire was on the point of destruction, but G. put himself at the head of a Chinese army with a staff of Eng. and Amer. officers. The career of the band was so glorious that it came to be known as the 'ever-victorious army.' G. recovered Nanking from the rebels and quelled the Taiping forces. In 1872 G. was appointed commissioner for superintending the Danube navigation, and in 1873 he was appointed governor of the Sudan, but resigned in 1880. In 1884 he was again sent to the Sudan where a revolt had broken out under Mahomed Ahmed, who proclaimed himself as the Muhamdi. The Brit. Gov. had ordered Egypt to abandon the Sudan, a most hazardous policy to carry out, and G. was deputed to go there and evacuate the Egyptian pop. The situation was beset with difficulties and peril. G. was surrounded and besieged in Khartoum. The siege had been protracted for five months when a relief party was sent from England. In Sept. the relief forces commenced their ascent of the Nile; by Nov. the expedition reached the Second Cataract and the borders of the Sudan. The navigation of the riv. was fraught with difficulties and dangers. It was the end of Jan. before the party, crossing the desert from Korti, made their way to Khartoum. On Jan. 28 the advance reached Khartoum, but found that the place had been captured by the rebels two days before and G. had been put to death. The way in which G. sustained his position at Khartoum is one of the marvels of hist. He was of different nationality and religion from the people of the garrison, but in them he inspired absolute faith and fidelity. On his staff he had only one Brit. officer. The fortifications of the tn. were inadequate, the provisions were scanty, but in the face of all odds he persevered. His jour. dating from Dec. 10 to Dec. 14 was preserved, and is one of the most ennobling and inspiring docu-

ments of hist. See B. M. Allen, *Gordon and the Sudan*, 1931, and P. Crabites, *Gordon, the Sudan, and Slavery*, 1933. The picture of Gordon in Lytton Strachey's *Eminent Victorians* (1918) is entertaining but unreliable.

Gordon, Charles W., see CONNOR, RALPH.

Gordon, Duke of Richmond and, see RICHMOND AND GORDON.

Gordon, Lord George (1751–93), leader of the 'Gordon' or 'No Popery' riots, was a son of the third duke of G. After some years in the navy he entered Parliament in 1774 and made himself conspicuous by his indiscriminate attacks on both Whigs and Tories. The 'Gordon' riots were provoked by the cancelling of the restrictions on Rom. Catholics. In 1780 G. convoked his followers at St. George's Fields, London, in order to petition a repeal of the new enactments at the House of Commons. The guards were called out, but the rioters held London for a fortnight, doing great damage to property. G. was committed to the Tower on a charge of treason, but was acquitted on the ground of insanity. He d. inane in Newgate jail, though some biographers add that he d. a convert to Judaism. See P. Colson, *Private Portraits*, 1948.

Gordon, George, see BYRON, BARON.

Gordon, George Hamilton, and Sir John Campbell, see ABERDEEN, EARL OF.

Gordon, John Brown (1832–1904), Amer. Confederate general and statesman, b. Feb. 6 in Upson co., (Georgia); graduated at the State Univ., 1852, and practised law. In 1861 entered the Confederate army as captain of infantry; rose to be lieutenant-general. Was wounded eight times during the civil war, and commanded a wing of Lee's army at Appomattox Court Hse. Wrote *Reminiscences of the Civil War* (1905).

Gordon, Sir John Watson, see WATSON-GORDON, SIR JOHN.

Gordon Bennett, name given to a nut in E. Central Africa seen by Stanley in 1875. Its identity remains undetermined; it may be one of the Ruwenzori group. It rises 14,000 ft. in height.

Gordon-Cumming, Roualeyn George, see CUMMING, ROUALEYN (GEORGE GORDON).

Gordon Highlanders, or the Gay Gordons as they are known historically, are one of the most famous regiments in the Brit. Army. The regiment was raised in 1794 by the marquess of Huntly, afterwards fifth and last duke of Gordon, who at that time was a captain in the 3rd Foot Guards, now the Scots Guards. The regimental tartan was the Gordon, with a distinguishing yellow stripe. The regiment was numbered 92nd, but in 1881 it was linked with the 73rd to form the G. II. The 75th was raised in 1787 by Gen. Sir Robert Abercromby for service in India. Gen. Robert Crauford of Peninsula fame was a captain in the 75th. The regiment served with distinction in India, then in the Kaffir war in S. Africa, the Indian mutiny, Egyptian campaign (1882), and Nile expedition. The 92nd first saw service in N. Holland at Egmont-op-Zee in 1799,

then in Egypt (1801), and the Peninsula. It formed part of the Scots Brigade at Waterloo and took part in Lord Roberts's famous march from Kabul to Kandahar in 1880, and it was also in the expedition to Chitral. Piper Findlater of the G. H. won the V.C. at Tirah, 1897, by playing the pipes as the Gordons stormed an Afridi stronghold, though he was wounded in both legs. During the Boer war it formed part of Gen. Sir George White's force defending Ladysmith. During the First World War it raised twenty-one battalions which served in France, Flanders, and Italy. Mons, Le Cateau, and other well-known battles are included in its long roll of battle honours. In the Second World War the G. H. were part of the 51st (Highland) Div. of Montgomery's Eighth Army in N. Africa and rode into Tripoli on the top of their infantry tanks (Jan. 1943). They were conspicuous for their stubborn defence, in Feb. 1944, in the battle for the bridgehead of Anzio, Italy. In Feb. 1945, on the W. front, they were part of Gen. Crerar's Canadian army and were involved in bitter fighting after crossing the Niers R., notably at Gennep and around Kessel.

Gordon-Lennox, Charles Henry, see RICHMOND AND GORDON, DUKE OF.

Gordon Riots, see LONDON, LOUD GLOUCE.

Gordon Setters, see under SETTER.

Gordonstoun, public school in Moray, Scotland, founded in 1934 by Eng. friends of Salem, Massachusetts, whose headmaster, Kurt Hahn of Salem, had been imprisoned by the Nazis in 1933 and had settled in Britain after his release. The orthodox class system prevails, with certain features of the Dalton plan. Seafaring ranks as the most important outdoor activity. The object of its nautical dept. is to train boys for the R.N. and the merchant service by preparing them in navigation and seamanship, while giving them the benefit of a normal public school education. The duke of Edinburgh (b. 1921) was educated there. The preparatory school for G. is Wester Elchies, Craigellachie, Strath-spey.

Gore, Catherine Grace Frances (1799–1861), Eng. novelist, b. at E. Relford, being the daughter of Charles Moody, a wine-merchant. She married in 1823 Capt. Charles A. Gore, and in the following year appeared her first novel, *Theresa Marchmont*. She resided principally on the Continent, and, until her death, her novels appeared with unfailing regularity. They described the life and customs of the fashionable society of the period, and attained a certain amount of transient popularity. She was also known as a song writer. She became blind shortly before her death.

Gore, Charles (1853–1932), Eng. bishop, son of Hon. Charles Alexander G. Educated at Harrow and Balliol College, Oxford. In 1880 became vice-principal of Cuddesdon College, and in 1884 librarian of the Pusey Library, Oxford. Ed. *Lux Mundi*, essays by contemporary theologians and others, in 1890. Vicar of Radley,

1895, and later canon of Westminster. Chaplain to Queen Alexandra, 1900, and to Edward VII. in 1901. In 1902 he became bishop of Worcester and in 1905 bishop of Birmingham. In 1911 he was appointed bishop of Oxford. In 1919 he resigned and ceased to have any see. A high churchman, with aspirations toward union of Churches. He was engaged in much humanitarian work, and was one of the high churchmen known popularly as Christian Socialists. He founded the fraternity called the Community of the Resurrection, with rules of special devotion and a common purse. His chief works are *The Church and the Ministry* (1889); *Roman Catholic Claims* (1889); *Bampton Lectures* (1891); *The Creed of the*



BISHOP GORE

Christian (1895); *The Body of Christ* (1901); *Spiritual Efficiency* (1904); *The New Theology and the Old Religion* (1908); *Orders and Unity* (1910); *The Religion of the Church* (1916); *Christian Moral Principles* (1921); *Belief in God* (1921); *Belief in Christ* (1922); *The Holy Spirit and the Church* (1924); *Church and Society* (1928); and *Jesus of Nazareth* (1929). He also ed. *Thoughts on Religion*, 1895, by G. J. Romanos, a converted agnostic man of science. See A. Mansbridge, *Edward Stuart Talbot and Charles Gore: Witnesses to and Interpreters of the Christian Faith in Church and State*, 1935.

Gore, bor. of S. Is., New Zealand, in the Southland dist., 60 m. N.E. of Invercargill, on the Mataura R. With an area of 1910 ac., the pop. (including Maoris) is 5000.

Goree, barren rocky is. 3 m. off the coast of Senegal, Fr. W. Africa, now forming part of the circonscription of Dakar. It lies at the opening of the fine harbour flanked by Cape Verde peninsula. Area, 675 ac., mainly covered by the tn. of G., which was once the chief commercial centre of Senegal, besides being a military stronghold, but has long been eclipsed by Dakar (q.v.), both as a commercial port and as a fortress, while all its more influential inhab. gradually moved to Dakar. The Dutch were in occupation of the is. in the seventeenth century, but in the Seven

Years war it was captured by the Eng. and then recaptured by de Ruyter, taken thirteen years later by the Fr., and again taken by the Eng. in the Napoleonic wars, but finally assigned to France in 1817. Pop. now only about 1500.

Gorge, see BASTION.

Görgei, Arthur (1818-1916), Hungarian commander and writer, b. at Taporez, Hungary. He fought in the Hungarian interests in the war against Austria and rose to be commander-in-chief in 1849. But his glory as a commander was eclipsed by his surrender to the Russians at Vilagos. His conduct on this occasion was judged with great harshness by Kosuth, and being accused of treason he was imprisoned at Klazenfurt. In 1867 he was pardoned. He pub. *Mein Leben und Werken 1848 und 1849* (1851), of which there is an Eng. trans.

Gorges, Sir Fernando (c. 1566-1647), founder of Maine, b. in Somerset. He was both sailor and soldier at an early date. Before he was twenty-one he was a prisoner of the Spaniards, and in the year 1599 he fought for Henry IV. of France. He became governor of Plymouth, and was an especial friend of Essex, whom he supported in his attempt to rebel. He was continued in his office as governor of Plymouth by James I., but he and his garrison were so badly neglected by the king that he finally resigned. He then turned his attention to the colonies and interested himself in many plantations. In 1639 he received a royal charter for Maine. See H. S. Burrage, *Gorges and the Grant of the Province of Maine*, 1923.

Gorgias, of Leontini, famous Sicilian rhetorician and sophist, b. about 480 B.C. In 427 B.C. he was sent to Athens to petition aid against Syracuse. The remainder of his life was spent in Athens as a teacher of rhetoric, and at Larissa. His style was highly ornate, rich, and elaborate, and considerably influenced the oratory of Demosthenes, though its effects on rhetoricians of inferior calibre was vicious. Plato's treatise on rhetoric is called the *Gorgias*, and in it G. is made to express his views on the art of oratory.

Gorgons, or Gorgones, monsters of classical mythology. Hesiod mentions three—Atheno, Euryale, and Medusa. They were represented as having snakes for hair and brazen claws. Medusa, the most famous Gorgon, was once a mortal maid, but was changed into a Gorgon by Athene in punishment for her relations with Poseidon, and whosoever gazed at her became a stone. Perseus slew her by means of a mirror and a sword. With the monster's head the hero turned Polydectes to stone. Athene afterwards received the head and bore it in her terrible aegis or breast-plate. Medusa in later art was represented as being of beautiful countenance.

Gorgonzola, tn. in Italy, about 12 m. N.E. of Milan. Celebrated for its famous cheese-making. Pop. 5000.

Gorhambury, seat of the earls of Verulam, in Hertfordshire, England, 2 m. W. of St. Albans. In the grounds are the ruins of Francis Bacon's mansion.

Gori, tn. in the Georgian S.S.R., N.W. of Tiflis. It has lumber mills. Pop. 10,000.

Gorilla, large man-like ape, which is a native of W. Africa. It is the largest of the anthropoid apes. It can be distinguished from the chimpanzee by the small ears, elongated head, the presence of a deep groove alongside the nostrils, the small size of the thumb, and the great length of the arm, which reaches half-way down the shin-bone in the erect posture. It also differs from the chimpanzee in its greater size, the height of a male G. being from $5\frac{1}{2}$ to 6 ft. Its weight is approximately 30 stone. In colour it is blackish, but the hair on the head and shoulders often has a reddish tinge. It is chiefly a vegetable feeder, but, like most apes, it also preys upon small mammals, birds,



GORILLA

A, right hand; B, foot.

and their eggs. The G. spends most of its time on the ground, although it is a skillful climber, and is not so very ferocious, for when attacked it generally avoids an encounter, but when driven into a corner is a dangerous enemy on account of its enormous strength. Gs. have not yet been tamed, and fully adult ones have never been seen alive in captivity. Various attempts have been made to add one to the Zoological Gardens, but the animals have all d. young. The G. was first made known to zoology by Paul du Chaillu in 1861. Later a second type was discovered, which is indigenous to high altitudes in the Belgian Congo.

Gorinchem, or Gorkum, Dutch tn. in the S. of Holland, about 23 m. S.E. of Rotterdam. Its fine fortified gateways are typical examples of Dutch architecture. Its salmon fisheries are important, and the chief exports are grain, hemp, and cattle. Pop. 13,500.

Goring, George Goring, Lord (1608-57), Eng. soldier, son of the earl of Norwich. He was known for his dissolute manners during his early life. He was appointed governor of Portsmouth, and was concerned in the Army Plot, which he betrayed to Parliament. Nevertheless he

declared for the king and held Portsmouth for him for a time. He took part in the battle of Marston Moor, and was defeated after Naseby at Langport, after which he retired to France. Finally he d. at Madrid.

Goring, vil. in Oxfordshire, England, 9 m. N.W. of Reading. It is an angling and boating centre. Has a Norman church. Icknield Street crossed the Thames at this point. Also the name of a suburb of Worthing, Sussex, but as yet not much developed.

Gorizia, cap. of the prov. of that name in Austria. It is situated about 30 m. N.W. of Trieste. It manufactures principally silk and cotton goods. Since the fourteenth century it has been a cathedral tn. and is now the seat of an archbishop. G., among other strong positions, was demanded from Austria by Italy in April 1915 as the price of her continued neutrality in the First World War and as 'compensation' for the advantages already gained by Austria (a party to the Triple Alliance) in the attack on Serbia (see also under AUSTRIA-HUNGARY). The Its. under Cadorna (q.v.) made a general attack on the Trentino front in the summer of 1916, and on Aug. 4 delivered a furious assault along an eight-mile line opposite G. The Austrian trenches were smashed by a continuous bombardment lasting many hours, and the Its. followed this by an impetuous infantry charge, which carried the heights on the W. bank of the Isonza overlooking G. and also the heights further to the N. S. of G. they stormed Monte San Michele, the key to the G. position which they had been striving to capture for the previous fourteen months. After two days' fighting Gen. Boroevic, the Croat-Austrian commander, lost all the Isonza heights, and on Aug. 9, 1916, It. soldiers escorted King Victor Emmanuel into G. But on Oct. 28, 1917, as a result of the resounding It. defeat at Caporetto (q.v.), the Austrians reoccupied G. for a short time. Pop. 48,000.

Gorkum, see GORINCHEM.

Gorky, Maxim, or Aleksie Maximovich Pyeshkov (1888-1936), Russian author, b. at Nizhni-Novgorod. His father dying, he lived with his maternal grandmother, and was apprenticed to a shoemaker at nine. In his youth he showed a roving and unsettled disposition, rarely remaining many weeks in any of the innumerable occupations in which he was engaged. He was successively a clerk in a draughtsman's office, scullery hand on board a Volga steamer, employed in a biscuit factory (vividly described in *Twenty-six Men and Another*), chorister in a travelling opera company, street hawker, and lawyer's clerk. His life on the Volga steamer and in the lawyer's office seems to have had most influence on his future life. His first sketch, *Makar Chudra*, appeared in 1892. *Chekaš*, pub. in 1893, estab. his position as a writer. This was followed in 1900 by *Foma Gordejew*, a romance. He then wrote a number of tales descriptive of a tramp's life, with which the vicissitudes of his early career had made him familiar. When he attempts to describe character and manners in the upper

classes his success is not so marked. His best characters are men in conflict with society, who by sheer force of personality rise above its moribund influences, and, in such characters, we have obvious reflections of G.'s own struggle. In 1906 his mission to U.S.A. in the cause of Russian freedom failed when it was discovered that the lady accompanying him was not his wife. He returned to Europe and settled at Capri. Returned to Russia before the First World War and founded a review. He then became a supporter of Soviet republicanism. After the revolution in 1917 he acted as propagandist for the Soviet Gov. His *Reminiscences of My Youth* appeared in Eng. in 1924 and *Bystander* in 1930. *Konovulov* is perhaps his most representative work. G.'s drama, *The Lower Depths* (1912), is a work of great power. Nizjni-Novgorod was renamed G. in his honour during his lifetime. Prince Kropotkin's *Ideas and Realities in Russian Literature* estimates G.'s position. See lives by R. Meincke, 1908, and A. Kahn, 1932; also *Filia Holtzmann, The Young Maxim Gorki*, 1949.

Gorky, formerly Nizjni-Novgorod, or Nizhniy-Novgorod: 1. Region of the R.S.F.S.R., situated on both banks of the Volga, two-thirds being on the right and one-third on the left. The surface is mostly flat, with forests, marshes, and lakes, with limestone hills in some parts. The prin. rvs. are the Voiga, which enters the region on the N.W. and flows eastwards, and the Vologa. The prin. crops are cereals, hemp, and flax, whilst fruit is largely grown. The area of land under forest is about half of the prov., and the timber industry is important. There are machinery and cutlery works, tanneries, flour mills, naphtha distilleries, etc., and a considerable trade in manufactured articles, corn, flour, hemp, etc. Shipbuilding is also carried on. The chief tns. of the region, besides the cap. G., are Pavlovo and Pochinka. Area 20,000 sq. m. Pop. 2,081,200. 2. City of Russia, cap. of the above region, situated at the confluence of the Oka and the Volga, 276 m. by rail E. of Moscow. Its position is excellent from a commercial point of view, as cereals and manufactured articles from the Oka basin, metal goods from the Kama basin, tea from Siberia, and corn, salt, naphtha, cotton, etc. for transit on the Volga, must all pass through the city. The city may be divided into three parts, the upper tn., the lower tn., and the fair tn. The upper tn. contains the Kremlin, situated at a height of 400 ft. on the r. b. of the Volga; it is surrounded by a high wall, and has the prin. edifices, including the governor's palace and two cathedrals. On the l. b. are monasteries and an old church. The lower tn. is the commercial quarter and contains many warehouses, depots, etc. On the flat sandy peninsula between the Oka and the Volga, connected with the tn. by a wooden bridge, the great fair is held. The quarter contains 3000 shops, whilst as many more are built expressly at fair time. G. is the chief centre of steamboat navigation of the Volga and

has manufs. of ropes, candles, and machinery, and distilleries, potteries, and flour mills; ship and steamboat building is also carried on. The trade of the city has in the past been more important than the manufs., and the celebrated Makarievskaia, or fair, which was held here from July 29 to Sept. 10, was a most important event, as the operations which were carried out influenced all the leading branches of Russian manuf. The value of the goods sold at the fair sometimes amounted to about £20,000,000. It was interrupted during the First World War, but restarted in 1923 on a smaller scale. The furs of Siberia and N. Russia are, for the most part, collected at G. G. is further notable in possessing the chief automobile factory of the U.S.S.R. Pop. (1943) 645,000 (an increase of nearly 200,000 in ten years).

Gorleston, seaside resort of Suffolk, England. It is part of the bor. of Great Yarmouth, and is situated on the S. side of the Yare.

Gorlitz (Polish *Zgorzeke*), tn. in Lower Silesia, Poland. It has a fine Gothic church which dates from the fifteenth century, and also a fourteenth-century tn. hall. It manufs. woollen goods, machinery, and glass. The tn. stands in the middle of huge forest lands. It was the home of the philosopher Boehme. Pop. 95,000.

Gorlovka, new tn. in the Donetz basin in the Stalin Region of the Ukrainian S.S.R. Building was begun in 1930. It specialises in the construction of mining machinery and is a centre of the chemical industry, producing nitrogen and nitrogenous fertilisers. Pop. 108,600.

Gorno-Badakhshan, autonomous region of the Tajik Republic, U.S.S.R. It lies in the Pamir Mts., which contain various minerals, including gold, radium, lead, and tin. Chitru. Khorog. See also BADAKHSHAN.

Gorodets, see KASIMOV.

Gorse, alternative name for furze (q.v.), a prickly evergreen flowering shrub.

Gorsedd, Welsh term denoting the national assembly and congress of bards, preliminary to the Eisteddfod. The ceremony dates back a thousand years.

Gorst, Sir John Eldon (1835-1916), Eng. statesman, b. at Preston, educated at St. John's College, Cambridge. In New Zealand he was of great value in establishing peace between the authorities and the Maori. He returned to England and was called to the Bar, 1865, and in the same year was elected M.P. for Cambridge. He sat for Chatham, 1875-92, and for Cambridge University, 1892-1906. He formed one of the Fourth Party (see BALFOUR; CHURCHILL, R.). He was solicitor-general, 1885-86; under-secretary for India, 1886; hon. secretary to the Treasury, 1891. He took a great interest in education, and was vice-president of the Committee of Council on Education until 1902. His attitude had always been independent, and he broke with his party on the question of Tariff Reform and lost his seat.

Gort, Sir John Standish, first Viscount

of Hamsterley (1886-1946), Brit. soldier, elder son of fifth Viscount G. of Limerick. Educated at Harrow and Sandhurst. Succeeded father as sixth Viscount G. of Limerick, 1902. Commissioned Grenadier Guards, 1905, Captain and A.D.C. to Sir Douglas Haig, 1914. Brigade major, 4th (Guards) Brigade, and later 1st (Guards) Brigade, rendering good service at Festubert and Loos, 1915. Appointed to command 4th Grenadier Guards, he led the battalion with great courage and ability at opening of third battle of Ypres, July 31, 1917. Took part in battle of Cambrai, 1917. In March 1918 commanded 1st Battalion Grenadier Guards at Arras. conspicuous service near Hamel while in temporary command of 1st (Guards) Brigade, notably at Flesquieres. Frequently wounded, was awarded V.C. for his great gallantry. Eight times mentioned in dispatches. In 1932 he became director of military training in India. Commandant Staff College, 1936. Military secretary, War Office, 1937; C.I.G.S. same year. Promoted general, K.C.B., 1938; G.C.B., 1940. Led B.E.F. to France, 1939. Successfully conducted the forced retreat to the Somme and Escourt without allowing his successive fronts to be broken. Equally successful in withdrawing the B.E.F. to the perimeter covering the Dunkirk beaches where most were evacuated. Passed over as commander-in-chief home forces by Gen. Sir Alan Brooke (later Lord Alanbrooke), being appointed inspector-general. Governor and commander-in-chief, Gibraltar, 1941. Later as governor and commander-in-chief Malta he achieved in the defence of Malta one of the greatest successes of his career, and in 1943 he was promoted to field marshal. The Maltese people, in token of their admiration, presented him with a sword of honour when he left in 1944 to become high commissioner of Palestine and Trans-Jordan. Here he won the confidence of all but the extremists of the Arab and Jewish parties; but at the end of a year his health broke down and he was compelled to resign. Viscount, 1945.

Gorton, Samuel (d. 1677), Eng. secretary, founder of the Amer. sect of Gortonites, b. about 1600 at G., Lancashire. In 1636 he sailed to Boston, Massachusetts, where he was continually involved in religious disputes. He pub. in England (1646) an account of his grievances against the Massachusetts Gov. in a tract entitled *Simplicius Defense against Seven-Headed Policy*. See L. E. Jones, *Samuel Gorton: a Forgotten Founder of our Liberties*, 1890.

Gorton, suburb of Manchester, England. Has important cotton mills and iron works.

Gortschakov, see GORCHAKOV.

Görz, see GORIZIA.

Goschen, George Joachim, first Viscount (1831-1907), Brit. statesman, son of a London merchant of Ger. origin, b. in London. He graduated from Oriel College, Oxford, with first-class honours in classics. In 1856 he became a director of the Bank of England; entered Parliament as Liberal member for the city of London,

1863; was appointed paymaster-general, 1865. In 1868 G. sat in Gladstone's Cabinet as president of the Poor Law Board, and became First Lord of the Admiralty in 1871. In 1878 he was elected representative for Great Britain at the international monetary conference held in Paris. In 1880 he became member for Ripon, and as ambas. to the Porte he persuaded Turkey to fulfil the obligations to Greece to which she was bound by the treaty of Berlin. He refused the offer of Speakership in the House, 1881. Gladstone, during his administration, found in G. an uncompromising opponent to his Home Rule policy. In 1886 G. lost his seat for E. Edinburgh, but in 1887, under Lord Salisbury's administration, sat as a Liberal-Unionist and accepted the chancellorship of the Exchequer. In 1877, after being defeated at Liverpool, he became member for St. George's, Hanover Square. In 1888 G. carried out a conversion of part of the national debt. In 1895 he became First Lord of the Admiralty. He was a firm and decided opponent of Chamberlain's Tariff Reform policy. G. pub. many works. His first important pub. was *The Theory of Foreign Exchanges*, 1863. Among his oth. works are *Cultivation of the Imagination* (1881); *Intellectual Interest* (1888); and *The Life and Times of George Joachim Goschen, Publisher and Printer of Leipzig* (1903). He was one of the chief promoters of the Univ. Extension movement. See A. R. D. Elliot, *List of George Joachim Goschen*, 1911.

Gosforth, urb. dist. of Northumberland, England, 2 m. N. of Newcastle-on-Tyne. Race meetings are held in G. Park. Pop. 18,000. Also the name of a vill. in Cumbrieland near Seatell and 2 m. from the coast. Has a notable Viking cross. Pop. 800.

Goshawk, or *Astur nobisbariae*, bird still found in many countries of Europe, but practically extinct in the Brit. Isles. It was formerly found here in fairly large numbers, and was used in the sport of falconry. Its extinction practically coincides with the disappearance of our large forests. The male bird is much smaller than the female. In colour the bird is brown on the upper part of the body and white underneath. The tail has dark bands across it. See also Hawk.

Goshen: 1. Part of anct. Egypt given by Pharaoh to the relations of Joseph. The chief tn. was Kevem (Gesem in the Septuagint), or in the classics, Phœnusa, modern Fakous. 2. Cap. of Elkhart co., in Indiana, U.S.A., on the R. Elkhart, a trib. of the Michigan. It is an important commercial centre, its chief manufs. being flour, condensed milk, knitted goods, and products of metal, wood, and rubber. It is served by the Big Four and New York Central railways and has a landing-field for air-mails. G. was settled in 1828 and chartered as a city in 1868. Pop. 11,000.

Goshen, or Gosench, Land of, part of Bechuanaland in Brit. S. Africa. Some renegade Boers founded a republic there in 1882. In 1884 it was placed under Brit. protection.

Goslar, anct. imperial city on the R. Gose, dist. of Hildesheim, in the prov. of Hanover, Germany. It was founded by the Emperor Henry I. in 922. G. has many antq. and interesting buildings, including the Kaiserworth, which contains the statues of eight emperors. Towards the S. is the Rammelsberg, which has many valuable ores (gold, silver, copper, zinc, etc.), the mines having been worked since the tenth century. Pop. 22,900.

Gosnold, Bartholomew (d. 1607), Eng. navigator who sailed from Falmouth, 1602, in the *Concord*, and discovered Cape Cod and some neighbouring is. He was the leader of an expedition which discovered the Virginian Capes, and founded Jamestown in 1606, where he d.

Gospel, The, the 'Good Story,' or the revelation of God to man of His purpose and will for the salvation of all mankind. It is not *qua* G. the G. as set forth by the four evangelists, but the story of God's will concerning man, as manifested in the life and death of Jesus Christ.

Gospellers, in church hist. name applied to two classes of people: (1) Various precursors of the Reformation, such as Wyclif and the Lollards, who laid much stress upon preaching the gospel and upon the dissemination of the knowledge of the gospels among the people; (2) Antinomian sect which arose about the time of the Reformation. The term is also used in the Church of England for the priest who reads the gospel, usually either from the N. side of the altar or from the middle of the choir.

Gospels, name by which the four accts. in the N.T. of the character, life, and teaching of Christ are designated. The first three (i.e. those of Matthew, Mark, and Luke) are called 'synoptic,' because they summarise the chief events in the life of Christ and, generally speaking, cover the same ground, while the author of the fourth gospel, that of John, follows independent lines. Again, the first three aim at mere narrative, but the purpose of the fourth is dogmatic, and it also probably aims at supplying the deficiencies of the others. The interest, too, of John's account centres in the divinity and personality of Christ, that of the other three in Christ's gospel. See MATTHEW; MARK; LUKE; JOHN.

Gospels, Harmony of the, see NEW TESTAMENT.

Gospoirt ('God's port'), markt. tn. and important naval depot to the W. of Portsmouth harbour, Hampshire, in England. It is connected with Portsmouth by a floating bridge. The Haslar Hospital, the Clarence victualling yard, and the barracks are among its notable features. Yacht-building is an important industry of G., and ships' anchors, cables, powder magazines, chains, and sails are also manufactured there. Pop. (including Alver-stoke) 40,000.

Goss, Sir John (1800-80), Brit. organist and composer, b. at Fareham, Hampshire, pupil of Atwood, who in turn had been taught by Mozart. He was appointed organist of St. Paul's in 1838, retired,

1872. Wrote some excellent anthems and other church music and glees.

Gossamer, fine filmy substance, something like cobwebs seen floating in the air in autumn. It is the web spun by certain small spiders; the threads are invisible when spun, but a number are woven together by the wind. See SPIDER.

Gossan, term common amongst the miners of Cornwall for the outcrop of a lode. The Gs. are often composed of rich veins of metal, and are very easily worked. The ease with which they are worked is largely due to the fact that being on the surface they have been thoroughly oxidised.

Gossau: 1. Vll. in the canton of St. Gall, Switzerland. Lace and embroideries are made there. Pop. 7500. 2. Vll. in the canton of Zurich. Cotton and silk industries. Pop. 4000.

Gosse, Sir Edmund William (1819-1928), Eng. poet, critic, and essayist, b. in London, the son of Philip Henry G., the naturalist. In 1867 he was appointed assistant to the Brit. Museum, and held that appointment till 1875. He then became translator to the Board of Trade. In 1884 he became Clark lecturer on Eng. literature at Trinity College, Cambridge, and in 1904 he was made librarian to the House of Lords. His style is characterised by its lucidity and sweetness. His chief works are *On Viol and Flute* (1873); *Studies in the Literatures of Northern Europe* (1879); *New Poems* (1879); *From Shakespeare to Pope* (1885); *Raleigh* (1886); *Life of Congreve* (1888); *History of Eighteenth-century Literature* (1889); *Robert Browning* (1890); *History of Modern English Literature* (1897); *Life and Letters of Dr. John Donne, Dean of St. Paul's* (1899); *Life of Jeremy Taylor* (1904); *French Profiles* (1905); *Coventry Patmore* (1905); *Life of Sir Thomas Browne* (1905); *Father and Son* (a study of his early family life) (1907); *Henrik Ibsen* (1908); *Two Visits to Denmark* (1911); *Portraits and Studies* (1912); and *Life of Swinburne* (1917). His chief service to letters is perhaps his introduction of modern European writers into Eng. For his services to Scandinavian literature he was created in 1901 a knight of the Norwegian order of St. Olaf. In early manhood a great friend of R. L. Stevenson, with whom he exchanged many interesting letters. *Selected Essays* were pub. in 1928. See life by E. Charteris, 1931.

Gosse, Philip Henry (1810-88), Eng. naturalist. After farming in Canada he returned to England and pub. *The Canadian Naturalist* (1840). In 1847, after visiting Jamaica for the Brit. Museum, he pub. *Birds of Jamaica*. Among his other works are *Actinologia Britannica* (1858-60) and *The Romanee of Natural History* (1860). See life by his son, Edmund G., 1890, and *Father and Son*, 1907.

Gosselies, tn. in Belgium in Hainaut, in the administrative dist. of Charleroi. It has coal-mines, and manus. cutlery, soap, and linen. Pop. 10,000.

Gosson, Stephen (1555-1624), Eng. author and divine; graduated from Oxford, 1576. He wrote the tragedy *Catilines Conspiracies* and the comedy

Captain Mario (neither now extant), but later wrote severely against the stage. G. was rector of Great Wigborough, 1591, exchanging his living for that of St. Botolph Bishopsgate, London, 1600. His famous *The Schoole of Abuse* (1579) led ultimately to Sidney's *Apologie for Poetry* (1595). G. was a contemporary of Lyly at Oxford, but though the *Schoole of Abuse* contains alliterative and antithetical tricks of speech and other features of Lyly's style, it is probably true, as Saintsbury says, 'that he inust rather have mastered the Lylian style in the same circumstances as Lyly, than have borrowed it from his fellow at Oxford.' This work is a 'pleasant invective against poets, pipers, players, jesters, and such-like caterpillars of a commonwealth,' and the G.-Sidney controversy which arose out of it shows that play-writing and play-acting were then becoming the concern of the best literary and social circles. He also wrote *The Ephemerides of Phialo* (1579) and *Plays Confuted* (1582). See T. Lodge, *Defence of Plays*, 1580 (ed. of 1583, p. 7); J. Collier, *Dramatic Poetry*, ii., 1698; and E. Arber, *The School*, 1888.

Gosudarstvennaya Duma, see DUMA.

Göta: 1. Canal in S. Sweden connecting the navigation of the Götafjord with the gulf of Bothnia by Lake Vener (Venern), Väiken, Wetter (Vettern), Boren, and Boxen, and the Baltic with the Kattegat (Cattagat). It terminates at Mem, 3 m. from Söderköping. Length about 50 m., depth 10 ft., breadth 79 ft. Including lakes some 235 m. are navigable and there are 57 locks. It was projected by Gustavus Vasa, but not carried out till 1810-32, under Count Platen and Telford. 2. Riv. flowing from Lake Vener to the Kattegat. It branches into two at Kongsgf, the S. branch passing Göteborg (Gothenburg). It is 68 m. long and navigable. To avoid the falls of Trollhätta near its source the Trollhätta Canal was constructed.

Gotaha, see GOTHA.

Gotama, see BUDDHA AND BUDDHISM.

Göteborg, see GOTHL.NBURG.

Götscalcus, see GOTTSCHALK.

Gotha, Almanach de', universal political register, pub. in Ger. since 1764 and in Fr. since 1871. It is a diplomatic governmental and statistical record of the world. A section of it is devoted to the genealogy of royal families, distinguished members of the nobility, etc., and statements as to pop., trade, and similar matters of all civilised states are contained in the other sections. It has gained authority all over the world from the care and exclusiveness with which it is ed. It takes its name from the place of pub.

Gotha, tn. of Thuringia, Germany, cap. of G. state, 14 m. W. of Erfurt. One of the most important mercantile tns. of Thuringia, it is among the foothills N. of the forest. There are narrow streets in the old part, but much has been destroyed by fires at different times. G. is a park fronted by the ducal castle of Friedenstein (1643) containing the state archives, ducal library, and a fine coin collection. Other noted buildings are the church of St. Mary

(twelfth century), Augustinian church (thirteenth century), new museum, town hall (a Renaissance building of the sixteenth century), the castle of Friedrichs-thal, and the observatory (1872). There is also the famous geographical estab. of Justus Perthes. Manufs. include porcelain, tobacco, smoked meats, sausages, sugar, toys, machinery, pianos, fire-engines, rubber hose, and woollens. The *Almanach de Gotha* has been pub. here since 1764, and Petermann's *Mitteilungen* since about 1854. The tn. is mentioned as early as 770 as 'Gothaha'. It was surrounded by walls, 930 by Gothard, abbot of Hersfeld. It was occupied

of the *Merrie Tales*, 1840, and *Nursery Rhymes*, 1842, W. Hazlitt, *Shakespeare Jest books*, 1864, J. Ashton, *Chap books of the Eighteenth Century*, 1882; E. Cunningham, *Amusing Prose Chap-books*, 1889. For simpleton stories generally see W. Clouston, *Book of Noodles*, 1888 (new ed., 1903) and W. Busch, *Deutscher Volkshumor*, 1877.

Gothard, St. see **GOTHARD**

Gothenburg (Swedish *Göteborg*), situated on the R. Gota and next to Stockholm, the cap. of the most important city of Sweden. The tn. is quite modern, having been rebuilt to a large extent in consequence of numerous fires but it was



GOTHENBURG

D. McLeish

The nuns and the Christina church, and the town hall

by Amer forces in mid April 1941. Pop. 50,000.

Gotha, Duchy of, see SAXE-GOTHA

Gotham, Tales of the Mad Men of, collection of jests, representing the absurd doings and sayings of the people of a Nottingham par. near Trent junction. The simplicity of the inhab. has become proverbial, but was said to have been assumed originally to avert a king's anger. One absurdity attributed to them is the building of a wall round the cuckoo to secure eternal spring. These tales are similar to the *astaea*, or *fable*, ascribed to the fifth century Alexandrian philosopher, Hierocles. The tales were first printed about 1550 under the title, *Merrie Tales of the Mad Men of Gotham*, collected by A. B. (Dr Andrew Boorde). The people of Abdera in Thrace had a similar reputation for folly, and such stories exist, *mutatis mutandis*, among almost all races of mankind. See J. O. Halliwell's reprint

originally founded in 1615 or thereabouts by Gustavus Adolphus. It has an excellent harbour seldom obstructed by ice, which affords a shelter for a large number of vessels from all parts of the world. It has a univ. (founded in 1899), philosophical faculty with over 500 students, and an academy of commerce. Its commercial importance dates from the continental blockade of 1806, when it became the chief Brit. depot of N. Europe. It is the prin. port in Sweden and the centre of the shipping industry. The harbour has been enlarged and the navigation school was rebuilt in 1916, while a marine museum was opened in 1913. Among its manufacturing industries are shipbuilding, cotton spinning, iron and steel milling and it produces sugar, paper, leather, sailcloth etc. It receives about one fourth of the total foreign commerce of Sweden. Has a valuable fishing industry. The lower portion of the tn., along the riv., has broad streets, partly formed by canals.

The exchange, cathedral, tn. hall, and museum deserve special mention among the buildings of G., and it has a fine garden belonging to the Horticultural Society. Pop. 290,400. The prov. of G. and Bohus has an area of 1948 sq. m. and a pop. of 523,500.

Gothic Architecture, see ARCHITECTURE, Gothic.

Gothic Language and Script. The Goths constituted the E. branch of the Germanic peoples. They are described by ant. writers as tall, athletic men, with fair complexions, blue eyes, and light hair, not unlike many Scandinavians of the present day. About the second century A.D. the Goths lived between the Vistula and the Black Sea. As late as the sixteenth century descendants of the Goths, speaking G., still lived in Crimea. The Goths played an important part in the European hist. of the fourth and fifth centuries. They were the first Teutonic people to be converted to Christianity, but they adhered to Arianism. About the same time they divided into Visigoths, or W. Goths (who then lived in what is now Bulgaria), and the Ostrogoths, or E. Goths (who were settled on the Black Sea). The great Visigothic apostle Wulfila, who lived in the fourth century and d. in 381 or 383, trans. a greater part of the Bible into G. He also invented an alphabet, consisting of twenty-seven letters, mainly based on the Gk. uncial script as used in his time. Some nineteen or twenty letters were taken over from the Gk. alphabet (the letter *e*, *theta*, however, received the phonetic value of *hw*), two letters were borrowed from the Runes (*q.r.*) or freely invented, and the remaining signs, partly modified, were taken over from the Rom. character. Six different MSS. have been found containing Wulfila's trans. of the Bible. The earliest extant MS. is the *Codex Carolinus*, preserved at the univ. of Mæssen (Germany), and assigned to the fifth century A.D.; but the most important and the most famous is the *Codex Argenteus*, preserved at the univ. of Upsala (Sweden) and attributed to the sixth century. It is a beautiful MS. written in silver and gold on purpured parchment, and is considered as one of the most precious treasures in the possession of any library. Some scholars hold the opinion that there were two varieties of the G. alphabet, the book hand, as represented by the aforementioned *codices*, and the cursive hand, as shown by a sale contract of the sixth century, now at the National Library of Naples, and by an alphabet written on a MS. from Salzburg, now at the National Library of Vienna. The Gothic *codices* have a very great philological importance; they are the oldest known literary documents written in a Germanic language, and are studied by scholars who desire to know what the T. atomic speech was like at that early day. This early Gothic language and script, however, had not the slightest influence on the subsequent Germanic culture.

'*Gothic Line*,' see under ITALIAN FRONT, SECOND WORLD WAR CAMPAIGNS IN.

Gothicus, see CLAUDIOUS II.

Gothland, Gotland, Gotland, or Gautland, largest of the Swedish is. in the Baltic, forming a prov. (lan) of Sweden, off the E. coast. It is about 40 m. E. of Sweden, about 1215 sq. m. in area, 83 m. long. The surface is 200-300 ft. above sea level. The coast is steep, but the interior mostly level. Visby (Visby) on the W. coast is the chief tn., connected by rail with Hense in the interior. The chief occupations of the people are agriculture, cattle-raising, shipping, fishing, and lime-burning. Timber, marble, sandstone, and lime are exported to Stockholm. There are some fine architectural remains. By the eighth century G. was trib. to Sweden, Visby being one of the most important trading tns. of N. Europe till late in the fourteenth century. In 1030 St. Olaf probably introduced Christianity there. It belonged to the Ger. Hanseatic League in the Middle Ages, being subject alternately to Denmark and Sweden from 1361. In 1645 it was finally ceded to Sweden. Pop. 38,900.

Goths, name of a powerful Teutonic people who played an important part in the barbarian invasions and made themselves masters of Italy for upwards of a century. From a fragment of a Gothic calendar (see *GOTHIC LANGUAGE*) it would seem that they originally called themselves *Gut-thiuda* ('the people of the Goths' *thiuda*, people). Their first home is supposed to have been the S. shores and is of the Baltic. Legend makes them to have come there from Scandinavia, but this does not appear to be supported by facts. The earliest mention of the G. belongs to the time of Alexander the Great, and is that of the Gk. traveller Pytheas of Marseilles. His evidence still exists in quotations from him to be found in the writings of Pliny and others. According to Pytheas a tribe of *Gothones* lived and gathered amber on the Prussian shores of the Baltic. Next Tacitus mentions the *Gothones*, evidently the *Gothones*, but they are neighbours of the Lygii, and no longer on the coast. Their certain hist. begins in the earlier years of the third century, in the reign of Alexander Severus. They had then founded an empire on the N. shore of the Black Sea and about the delta of the Danube. They greatly increased their numbers by conquering other Teutonic tribes, and came into conflict with the Romans, into whose prov. of Dacia they made successful incursions. Gibbon says (*Decline and Fall*, x.): 'The Emperor Decius (A.D. 249) . . . was summoned to the banks of the Danube by the invasion of the Goths. This is the first considerable occasion on which history mentions that great people.' They devastated Moesia and Thrace, vanquished and killed Decius, and withdrew on receiving great sums of money and a promise of yearly tribute. In 258-59 they crossed the Black Sea, the Bosphorus, and the Hellespont, embarked on the Mediterranean, pillaged the shores of Asia Minor, burnt the temple of Ephesus, and sacked Athens. In 269 they equipped an immense fleet, ravaged Crete and Rhodes,

and, returning through Thessalonica, were completely crushed by the Emperor Claudius. They recovered, however, and the Emperor Aurelian secured a term of comparative peace only by ceding to them Dacia and the l. b. of the Danube. During this period the G. mingled with the Romans, and were influenced by the Rom. civilisation; they were converted to Christianity.

It was at this epoch that Wulfila trans. the Bible into the Gothic language (q.v.). Now, too, the G. divided themselves into two great groups, the Visigoths (or W. G.) inhabiting the slopes of the Carpathians in Dacia and the Ostrogoths (or E. G.) who dwelt on the shores of the Black Sea. This separation became complete when, after conflicts with Constantine (324), who imposed peace upon them, and with Valens, whom they subdued, the terrible Huns made a successful irruption among them and completely crushed their empire. The Ostrogoths submitted to the Huns, the Visigoths crossed the Danube, and settled finally within the Rom. Empire (376). Their hist. deviates at this point.

The Visigoths made peace with Valens and were allotted cantonments. Many accepted service in the Rom. army, others, who came to be known as the *Mesogoths*, devoted themselves to agriculture under Rom. protection. In 387, provoked by the vexatious conduct of the Rom. functionaries, they revolted and forced the Emperor Theodosius to conclude a new treaty with them, by which some received land and others provisions in exchange for military contingents. After the death of Theodosius their king, Alaric, claimed a prov. for his people. The refusal of this demand led to an insurrection which marks an epoch in the hist. of Europe. The Visigoths under Alaric devastated Macedonia, Greece, and Illyria, then, passing into Italy, they took and pillaged Rome (410). Alaric d. the same year. Withdrawing from Italy, the Visigoths under Alaric's successors overran S. Gaul and Spain. Under Wallia (415-19) they obtained from the Rom. *Aquitania secunda*, and fixed their cap. at Toulouse. The Gothic kingdom was actually now a vassal kingdom of the Rom. Empire; the G. greatly helped the Romans in their conflicts with the Vandals, the Huns, and the Alani, and in their turn reaped benefit from the Rom. civilisation. Theodoric I. played an important part in the reduction of the Huns under Attila at Châlons. Theodoric II. and Euric conquered Spain and extended their kingdom as far as the Loire. They estab. a constitution and adopted some of the arts of civilised life. But they were forced to retreat by the Franks under Clovis (507), and their kingdom was completely broken up by the Saracens (711). Dispersed and decimated the greater number of the Visigoths settled, keeping up their institutions, in the region of the Pyrenees. Their laws were trans. into Castilian under Ferdinand III. (thirteenth century) to serve as their code of justice. They gradually became absorbed in the Lat. peoples of Spain and Languedoc (see CATALONIA).

The Ostrogoths took part with the Huns under Attila in the expedition against Gaul and so encountered their kinsmen, the Visigoths, in battle, sharing in the terrible defeat at Châlons (451). Under their greatest sovereign, Theodoric, they warred against the E. Emperor Zeno and acquired some of his richest provs. Theodoric also defeated Odoacer (q.v.), king of Italy (488), and reigned gloriously and wisely in Italy until his death (526), dealing even-handed justice to the conquered and to those of his own race. On the death of Theodoric the Emperor Justinian organised a campaign against the Ostrogoths with the object of wresting Italy from them and restoring it to the emperor of Constantinople. After a protracted struggle Justinian's general, Narses, succeeded in crushing them, and with their defeat (553) Theodoric's kingdom came to an end. The Ostrogoths dispersed: many of them were absorbed in the Rom. Empire, some returned to the Danube, where they commingled with other Teutonic peoples. A small number of the Ostrogoths have an interesting hist. apart from that of the rest. These had remained N. of the Black Sea when the great body of the people migrated with the Huns. They survived all the other Gothic peoples and were found in the Crimea by the Flemish traveller, Burbeck, in the sixteenth century, still speaking their own language. They were in succession vassals of the Rom. Empire of the E. and of the Mongols; finally they became absorbed in the Tartar race. See E. Gibbon, *Decline and Fall*, 1776-88; T. Hodgkin, *Italy and her Invaders*, 1899; G. Schutte, *Our Forefathers*, 1929-33; F. Lot, *Invasion d'Armies*, 1935; and A. Vasilev, *Goths in the Crimea*, 1936.

Gotland, see GOTHLAND.

Goto, or *Gotto* group of is., five in number, belonging to the Jap. archipelago, and forming the westernmost group in the channel of Korea, W. of the is. of Kiushiu. The largest of the group is about 25 m. long.

Götterdämmerung, see RAGNARÖK.

Gottfried von Strassburg (*Strasburg*), Middle High Ger. epic poet, the most brilliant of the thirteenth century (fl. c. 1200), contemporary with Hartmann von Aue, Wolfram von Eschenbach, and Walter von der Vogelweide. In 1210 he began his great epic, *Tristan und Isolde*, after Fr. originals (especially that of the *frère Thomas* of Brittany). He d. between 1210 and 1220, leaving his work unfinished. It was completed by Ulrich von Turheim (1233-66) and Heinrich von Freiberg (c. 1300). This poem furnished the subject for Wagner's great opera. See works, F. H. von der Hagen's ed., 1823; Bechstein's ed., 1881; eds. and trans. of *Tristan* by H. F. Massmann, 1843; H. Kurz, 1844; W. Hertz, 1877; and W. Simrock, 1885; also works of W. Franck, 1865, and W. Götlicher, 1887.

Gotthardt, Matthias, see GRUNEWALD.

Matthias.

Gothelf, Jeremias, see BRITZIUS, ALBRECHT.

Göttingen, tn. of Hanover, Germany,

cap. of G. principality, on the Leine Canal, at the foot of Mt. Hainberg, 37 m. N.E. of Kassel. The famous univ. founded here by George II. of England (c. 1737) was rechartered in 1836 as 'Academia Georgia Augusta.' The tn. was taken by Tilly in 1626. The Royal Academy of Sciences was founded in 1751 by Haller. In connection with the univ. are the academical museum, botanical garden, library, observatory, institutes of anatomy and chem., etc. Manufs. linen and woollen stuffs (famous in the fourteenth and fifteenth centuries), leather goods, musical and surgical instruments, scientific apparatus, soup, starch, sausages, and beer. The book trade is important. The G. school of poets and writers included Voss (d. 1826), C. Stolberg (d. 1819), F. L. Stolberg (d. 1821), Holtz (d. 1776), and Leisewitz (d. 1806). The tn. fell to Amer. forces in April 1915. Pop. about 41,000. See F. Frensdorff, *Göttingen in Vergangenheit und Gegenwart*, 1887.

Gottschalk, *Gotescaucus*, or *Fulgentius* (c. 805-68), Ger. monk, prominent in a theological controversy of the ninth century. Son of Berneo, a Saxon count, he early entered the monastery of Fulda. Prevented from securing release from his vows by his abbot, Rabanus Maurus, he was transferred to the Benedictine convent of Orbais (Soissons). G. studied St. Augustine's writings and adopted the doctrine of twofold predestination (to sin or salvation). He visited Italy (837-38 and 845-48), but his views roused much opposition. At the synod of Mainz, 818, he was found guilty of heresy by Hincmar, and condemned at an assembly at Quiréy, 819. He d. imprisoned in the monastery of Hautvilliers, Rhéims.

Gottschall, Rudolf von (1823-1909), Ger. dramatist, poet, and miscellaneous writer. B. at Breslau, he studied at Königsberg, Breslau, and Berlin. His sympathy with the revolutionary movement of 1848 produced the tragedies *Die Marschallse* (1848); *Wiener Immortellen* (1848); *Lambertine von Méricourt* (1850); and *Ferdinand von Schill* (1851); the first poems, *Gedichte* (1850), and the lyric, *Die Göttin* (1853). Among his plays are *Pitt und Fox* (historical comedy), the most successful (1851); the tragedy *Mazeppe* (1859), his best play; and *Katharina Howard* (1872) (See *Dramatischen Werken*, 2nd ed., 1881). In two epic poems, *Die Göttin* (1853) and *Carlo Zeno* (1854), he largely abandoned the exaggerated style of his earlier poems. Among his novels may be mentioned *Im Banne des schurzen Adlers* (1875); *Das Goldene Kalb* (1880); *Die Papierprinzessin* (1883); and *Die Tochter Rubenzahl* (1889). In his valuable *Die deutsche National-literatur des 19. Jahrhunderts* (the 7th ed. of which appeared in 1901-2), and also in a work on poetry (1858, 6th ed. 1893), he advocates the cause of 'modern ideas' in literature. After writing a number of other plays, he became, in 1864, editor of two Leipzig journs, *Blätter für literarische Unterhaltung* (1861-88), and the review, *Unsere Zeit*. See autobiography, *Aus meiner Jugend*, 1898, and biographical study by M. Brasch, 1892.

Gottsched, Johann Christoph (1700-66), Ger. critic and writer, educated at Königsberg Univ. He was prof. of poetry in 1730, of logic and metaphysics in 1734. G. tried to abolish the bombastic affectations of the second Silesian school, and substitute a nobler drama based on Fr. models. His *Kritische Dichtkunst* appeared in 1730, founded on Boileau's *Art poétique*. He became later involved in a violent literary controversy with Bodmer and Breitinger. Lessing (1729-1781) destroyed his reputation as a 'literary dictator,' and Gollert (1715-69) replaced him as a popular favourite about 1750. See J. A. Ernesti, *Memoria J. C. Gottschedi*, 1767; G. G. Gervinus, *Geschichte der National-literatur der Deutschen*, 1835-38; T. W. Danzel, *Gottsched und seine Zeit*, 1848; K. Breitmaier, *Die poetische Theorie Gottscheids und der Schweizer*, 1879; E. Reichol, *Zu Gottscheids Lehrjahren*, 1892; G. Krause, *Gottsched und Flotowell*, 1894; E. Wolff, *Gottscheids Stellung im deutschen Bildungsleben*, 1895-97; G. Wanckel, *Gottscheids und die deutsche Literatur seiner Zeit*, 1897; E. Reichelt, *Ein Gottsched-Denkmal*, 1900, and *Gottsched: Biographische Skizze, Kleines Gottscheids-wörterbuch*, 1902; and G. Schumann-KV, *Gottscheids deutsche Bildungszeit*, 1939. Reichelt founded the Gottsched Gesellschaft in Berlin.

Götz von Berlichingen, see BLRICHINGEN, GOTZ VON.

Gouda, or Ter-Gouw, tn. of Holland in the prov. of S. Holland. It is situated on the N. side of the Gouw, where it joins the Ysel, 10 m. N.E. by E. of Rotterdam. Founded in 1445, it was destroyed by fire, and rebuilt in 1552. Formerly the priu. industry was cloth weaving, and later the making of clay pipes. It now has factories for stearine candles, cigars, and yarn, and the G. cheeses are celebrated. Its shipping trade is large and it is one of the chief markets of S. Holland. It has a regular steamboat service along the canals. Pop. 36,900.

Goudimel, Claude (1505-72), musical composer of the sixteenth century. He was b. probably at Besançon, but both the Fr. and Belgians claim him as their countryman. In 1510 he founded a school of music at Rome, but later returned to Paris, where he pub. in 1555, a musical setting of Horace's *Odes*. He also pub. in 1565 a collection of vocal pieces as a setting to the celebrated Fr. version of the Psalms by Marot and Reza; and some of his songs appeared in a collection at Lyons, entitled *La Fleur des Chansons* (1571). In 1572 G. became a convert to the reformed religion and met his death in the massacre of the Huguenots. See Michel Brenet's 'Biographie' (*Annales franc-cantouises*, Besançon, 1898, P. Jacquin).

Gouge, see under CHISEL.

Gough, Sir Hubert de la Pde (b. 1870), Brit. general, b. Aug. 12, eldest son of Gen. Sir Charles John Stanley G. Educated at Eton and Sandhurst. Joined 16th Lancers, 1889. Tirah expedition, 1897-98. Severely wounded in S. African war, 1899-1902. Prof. at Staff College, 1904-6. As brigadier-general in com-

mand of 3rd Cavalry Brigade at the Curragh in March 1914, he was the first one of those officers who refused to be employed against any resistance from Ulster to the Home Rule Act if passed. In France and Flanders in the First World War, with 2nd Cavalry Div. and 7th Div., 1915; 1st Army Corps, 1916. Commanded the ill-starred Fifth Army, 1916-18: Pozieres, Thiepval, Beaumont-Hamel; operations on Ancre, Langemarck, and St. Quentin—promoted to Lieutenant-general. He was unsuccessful in defence at the Somme, March 1918, and was superseded. Chief of the allied mission to the Baltic, 1919. Retired with rank of general. In *The Fifth Army* (1931) he vindicated his conduct of affairs in 1918 and this vindication was subsequently accepted by Lloyd George, who, as Prime Minister, had been instrumental in G.'s recall.

Gough, Hugh, Viscount (1779-1869). Brit. field marshal, b. at Limerick. He was a descendant of Francis G., bishop of Limerick in 1626. In 1793 he obtained a commission in the army, and saw active service in S. Africa and in the W. Indies. In 1809 he was called to take part in the Peninsula war, and joined the army under Wellington. He was severely wounded at Talavera and had his nose shot off. He was afterwards promoted lieutenant-colonel. He also fought at the battle of Barrosa, and again at Vittoria and Nivelle, where he was once more severely wounded. He returned home at the close of the war and enjoyed a respite of some years from active service. In 1830 he was promoted major-general. In the first Chinese war he was appointed commander-in-chief of the British forces and achieved many victories in the face of great difficulties. In 1862 he was made a field marshal. See R. S. Rait, *Life and Campaigns of Hugh, 1st Viscount Gough, Field Marshal*, 1903.

Gough, Richard (1735-1809). Eng. antiquary, b. in London, d. at Enfield. His father was a director of the E. India Company and a wealthy man. G. showed signs of an unusual intelligence at an early age, and at sixteen pub. a work called *Geography Modernised*. He went to Cambridge in 1752 and began his work there on Brit. topography. His best known publs. are *History of the Society of Antiquaries* (1768) and *The Sepulchral Monuments of Great Britain* (1786).

Goujon, or Gougeon, Jean (c. 1515-63). Fr. sculptor of the Renaissance, known as the French Phidias and the Correggio of sculpture. He is first mentioned in 1540 as working on St. Maclov at Rouen. In 1541 he went to Paris, joining P. Lescot in the decoration of St. Germain l'Auxerrois, his work there including the 'Evangelistes' and 'Déposition de la Croix' (now in the Louvre). G. decorated the Château d'Écouen for the Huguenot constable Anne de Montmorency, 1544-47. His chief productions there were 'La Victoire ailée,' 'La Foi,' 'Le Sacrifice d'Abraham' (Chantilly). He did woodcut illustrations (1547) to the *Vitrue de J. Martin*. G.'s first period

of work upon the Louvre was between 1547 and 1550, including the staircase of Henri II., figures of the Géls-de-Bœuf, caryatides of the Salle des Cent-Suisses in the Louvre, and figures of the Fontaine des Innocents, 1549. His 'Diane Chasseresse,' originally in the courtyard of the Château d'Anet, is now in the Louvre. By 1560 the Louvre decorations were completed. G.'s name disappears from the list of 'Maîtres Maçons' under Lescot, 1560-61. The tradition that he was shot during the St. Bartholomew massacres (1572) is now no longer accredited. See L. Audot and A. Pottier, *Essai sur la vie de Goujon*, prefixed to Itovell's engravings of G.'s works, 1827-44, and R. Lister, *J. Goujon*, 1903.

Goulburn: 1. City of Argyll co., New S. Wales, Australia, on R. Wollondilly, 128 m. S.W. of Sydney. It is the see of the Anglican bishop and a Rom. Catholic archbishop. Public buildings include two cathedrals, hospital, jail, and a council library. There are breweries, tanneries, boot and shoe factories, and flour mills. G. co. has Murray R. on the S. Pop. 16,000. 2. Riv. of Victoria, Australia, rising near Emerald Hill in the Great Dividing Range (Wonnangatta co.), flowing N. and N.W. through the Jamison and Wood's Point goldfields, and falling into Murray R. about 10 m. above Echuca. Irrigation works have been carried on in the valley since 1893. The course above Seymour is much impeded by rapids, fallen trees, and rocks, and not easy to make navigable. Total length about 345 m.

Gould, Benjamin Apthorp (1824-96), Amer. astronomer, son of B. A. Gould, the educationist (1787-1859). He was organiser and director of the National Astronomical Observatory at Córdoba, Argentina, from 1868 to 1883. His *Uranometria Argentina* (1871) did for the S. hemisphere what Argelander's *Atlas* (1843) did for the N. G. also wrote *Catálogo de Zonas Estelares* (1881). He was among the first to realise the importance of photography in determining stellar positions accurately. He became president of the Amer. Association for the Advancement of Science, 1868.

Gould, Sir Francis Carruthers (1844-1925), Eng. writer, son of Richard Davis G., architect. Member of the Stock Exchange for some twenty years of his early life, and later assistant editor of the *Westminster Gazette*. Early evinced great skill in caricature and was for many years a contributor of illustrations to the *Pall Mall Gazette* and *Truth*. A notable authority and lecturer on parliamentary matters. His brilliant series of cartoons in the *Westminster Gazette*, extending over a considerable number of years, to the very end of its appearance as an evening paper, were an undeniably strong factor in the Liberal cause, and were doubtless that part of his work which primarily earned for him his knighthood in 1906. They dealt with every important phase of parliamentary controversy, epitomising the very pith of a political situation in cleverly executed sketches often adapted

from scenes in Shakespeare or Dickens, or from the drawings of Tenniel in *Alice in Wonderland*. His draughtsmanship was angular and rough, but the humour was unfailing and often startling. His pubs include Froissart's *Modern Chronicles* (1902-23), *Who Killed Cock Robin?* (1897) and *Tales told in the Zoo* (1900).

Gould, George Jay (1884-1923) Amer. financier, son of Jay G. Privately educated he later obtained control of large railway interests. He was president of the Little Rock and Fort Smith Railway 1888, of the St Louis, Iron Mt and N. Missouri Pacific and others 1893, and of the Manhattan Elevated 1892.

Gould, Gerald (1885-1937) Eng poet and critic, educated at Norwich and Magdalen College, Oxford. From 1911 he was associate editor of the *Daily Herald*. Among his works are *The English Novel of To-day* (1921), *Beauty the Pilgrim* (1927), and *The Future of Laughter* (1929).

Gould, Jay (1836-92) Amer capitalist educated at Hobart Academy and on his father's farm for a time, he was engaged in surveying (1852-56) and in the lumber and tanning business. By 1857 he became chief shareholder in the small bank at Stroudsburg, Pennsylvania. He began buying up railroad bonds at this time, becoming a broker in New York 1859. After the panic of 1857 he became president and manager of the Rutland and Washington Railway, later uniting it with the Saratoga Railway. He was president of the Rio Railway Company, 1868-1872, and introduced into the company 'Boss' Tweed and other rascals who unscrupulously enriched themselves at the expense of the public. He controlled the Union Pacific from 1873 to 1884, investing largely in the stocks of other railroads and telegraph companies finally controlling them all. He made about 25,000,000 dollars. His worst action was a scheme formed with 'Jim' Fisk for cornering the gold market, leading to the Black Friday panic 1869. He has been called the Napoleon of America since Sir Ogilvie's *Life and Death of J. Gould* 1892.

Gould, Nathaniel (1847-1919) Brit novelist b. at Macclesfield who had a wide experience in journalism in England and Australia. His very numerous books include about 130 novels of a sporting character. Among the best known of these are *The Double Tent* (1891), *Jhr. of Augy* (1891), *The Miner's Cup* (1892), *A Gentleman's Life* (1898), *The Stiff Mystery* (1900), *The Laugh & Race* (1901) and *A Run of Luck* (1904). Other publications include *On and Off the Field in Australia* (1891), *Sporting Sketches* (1893) and *The Roar of the Ring* (1900).

Gould, Sabine Baring-, see BARING GOULD

Gounod, Charles François (1818-93) Fr. composer of sacred music and later of opera b. in Paris. His mother was an accomplished pianist. He showed an early passion for music and after studying under Halévy passed brilliantly through the Conservatoire, receiving at the age of

twenty one the Fr. Instituto's *grand prix* for composition. His intention had been to study for holy orders and he went to Rome with that object, and although nothing came of it he continued to devote himself wholly to the composition of church music. The great success of his third mass (1849) aroused in him the ambition to explore a wider field, and, saturated with the ideals of German art, music, and literature, he turned to the lyric drama, *Phénix et Baucis* being his first attempt. But it was not until 1851 that he was accorded any recognition as an operatic composer in that year *Sapho* was produced, and was very generously received. In 1852 he wrote choral music for a production of Ponsard's *Ulysse*, and two years later a favourable reception was given to



CHARLES FRANÇOIS GOUNOD

his *In Nomine sancte*. His real success however came with the production of (1859), a very beautiful work in which G. reaches its zenith, and perhaps the most widely popular opera ever written. Subsequently he wrote *La Juive de Solz* (1862), *Mireille* (1864), *La Colombe* (1866), *Homeo et Juliette* (1867), *Cinq Mous* (1877) and *Polyeucte* (1878), none of which has any present interest although excerpts are frequently given on the concert platform. He also wrote some oratorios which were popular in London while G. stayed during the Franco-German war and afterwards until 1873. Among other but slighter works is his popular *Mourning March of a Marionette*. His work is full of sweet melody and harmony and his writing for the orchestra parts in his operas is beautifully balanced and restrained. He also wrote a fairly large number of songs and romances among the former being his famous *Le Maria* based on Bach's first prelude, and many devout songs the less devout being the better. His own *Mémoires d'un artiste* were published posthumously (1896). See also C. G. SAINT-SAËNS, *Charles Gounod et le Don Juan de*

Mozart, 1892, and 'Le Livret de Faust' (*Monde Musicale*, 1914); and G. Doret, *Musique et Musiciens*, 1915; also lives by M. A. do Bovet, 1890; P. L. Hillemacher, 1906; C. Ballaigues, 1910; and J. G. Prod'homme and A. Dandolo, 1911.

Gour, see GHUR.

Gouraud, Henri Joseph Etienne (1867-1916), Fr. general, b. in Paris. Rendered distinguished service in Moroccan campaign, 1911-14. In the First World War he succeeded Gen. d'Amade as commander-in-chief of the Fr. forces in the Dardanelles, having previously commanded the 1st Corps on the W. front. By 1919 he had become commander-in-chief of the army of the Levant. In his able defence in the Argonne sector he earned the sobriquet the 'Lion of the Argonne.' Was wounded by a shell in 1915, losing an arm. In the allied offensive, July-Aug. 1918, he defeated the Ger. forces E. of Rheims. Awarded the grand cordon of the Legion of Honour. Sent, in 1919, to act as Fr. high commissioner to Syria, where he succeeded in establishing the Fr. mandate. Member of the Conseil Supérieur de la Guerre, 1922. Military governor of Paris, 1923-1938.

Gourd, name given to various species of the order Cucurbitaceae which are distinguished on account of their fruit. These fruits are nearly always large and fleshy, curiously shaped, and abound in nutritious matter. Most of the Gs. belong to the genus *Cucurbita*, e.g. *C. Pepo*, the pumpkin; the bottle G. or calabash cucumber is *Lagenaria siceraria*, with a bitter and dangerously purgative fruit; the snake G. belongs to the genus *Trichosanthes*; the bitter G. or colocynth is *Citrullus colocynthis*, and is allied to the water-melon.

Gourko, Joseph Vladimirovich (1828-1901), Russian count and general of Lithuanian extraction. His claim to distinction is based on his services in the Russo-Turkish war of 1877, where he greatly distinguished himself, capturing Sofia, Philippopolis, and Adrianople. He also took part in the Crimean war, being stationed at Belbek. For his services in the Russo-Turkish war he was decorated with the order of the second class of St. George. From 1879 to 1880 he was governor of St. Petersburg, and from 1883 to 1894 governor-general of Poland.

Gourmont, Remy de (1858-1915). Fr. author and critic; b. April 4 at the Château de la Motte, Bazoches-en-Houlme (Orne). Studied at the Lycée of Coutances, and at the Faculty of Letters at Caen. Went to Paris, and was attached to the Bibliothèque Nationale, 1883-91. His early works, from *Un Volcan en éruption* (1882) to *Les Canadiens de France* (1893), were of the diffusion-of-knowledge type. Then came novels, of which the best known is *Saturne* (1890). In 1890 helped to found the *Mercure de France*; ed. it and several other journals. His style was fastidious, and he indulged in much philosophic finesse in his essays. See M. Coulon, *L'Enseignement de Remy de Gourmont*, 1924; and life by P. Jacob, 1931.

Gourock, tn. of Scotland, in W. Renfrewshire, situated at the mouth of the Clyde on the l. b. It is 2 m. W. of Greenock and has of late years become famous as a holiday resort, having considerable passenger traffic by the Clyde steamers. Pop. 9000.

Gout. A first attack of G. usually commences by waking the patient up during the night with intense pain in the foot. The next morning there is redness over one or more joints, with extreme tenderness. The pain and swelling last for a week or more and, as a rule, leave the patient feeling better than before. An attack of G., though not serious, is a warning that the patient must reconstruct his mode of living and endeavour, as far as possible, to avoid unnecessary worry, take regular exercise, and be warmly clad, so as to avoid any risk of chill. An appropriate diet is all important. Alcohol should be avoided—beer, stout, and porter are the most injurious forms; strong wines (port, sherry, Madeira) come next and then light wines (hock, etc.) and spirits, which are the least injurious forms. But, unless the attack is due to a preventable cause, total abstinence is strongly recommended. There should also be distinct moderation in food. A 'purin' free diet should be aimed at, that is to say, one containing the smallest possible amount of nitrogen. For instance, butcher's meat should be restricted, and eggs taken but occasionally. The disadvantages of a restricted diet are that the patient feels he is not getting sufficient nourishment if leading an ordinary life. It is better therefore to commence the regimen during an attack, when loss of appetite is generally present. The patient is then content to live on slops such as vegetable soups, milk puddings, gruel, arrowroot, etc., while barley water is advantageous in quenching thirst. When the attack lessens and the appetite improves the patient may be given fried or boiled fish, without any indigestible sauce, chicken, and other forms of white meat. Recurrent attacks of G. are apt to appear with slight cause, or none at all, and to affect an increasing number of joints, which become misshapen and stiff, the attacks becoming prolonged until the pain is almost continuous.

It is of interest to consider that the prime cause of G. is the failure to utilise the food taken, sometimes because too much is taken, sometimes because of the failure of the digestive powers, sometimes because the kidneys are incapable of performing the work required of them. Despite the peculiarities of any individual case, these three conditions become more marked, and a more and more rigid diet is indicated, till at length only as much food is taken as can be used and the waste products, particularly uric acid, removed by the kidneys. The kidneys are relieved by flushing them out with water, which can be taken first thing in the morning, last thing at night, and in the intervals between meals. If this is not done the products of digestion circulating in the blood injure the walls of the blood vessels

and so weaken them that they may burst. When this result occurs in the brain the condition is described as apoplexy, and in all parts of the body impaired vessel walls interfere with the nourishment of the parts they supply. When this takes place in the lungs bronchitis sets in; in the case of the skin eczema and other diseases result. In addition the changes in the vessel walls produce changes in the heart and kidneys which are of such extreme severity that they may bring about a fatal result. As G. tends to run in families the tendency must be counteracted. The children of gouty parents should avoid the errors of their elders, particularly in diet, mode of life, such as exposure to cold, and lack of exercise. Regular exercise sets in two ways: by utilising the products of digestion and increasing the amount of invisible perspiration less work is thrown upon the kidneys. Further, a gouty parent should seriously consider the question whether his profession or occupation is a suitable one for his children. The treatment of G. mainly depends upon relieving the pain by heat, i.e. by hot baths, to which soda may be added, the administration of potassium and lithium salts (since the urates of these metals are more soluble than sodium urate, which forms in their absence), and colchicum.

Gouvier St. Cyr, Laurent, Marquis de (1764–1830), Fr. marshal, b. at Toul. He took part in the Prussian and Polish campaigns of 1807 and 1808, and in Aug. 1812 obtained a victory over the Russians at Polotsk, for which he was created a marshal of France. St. Cyr accompanied Napoleon all through the Russian campaign. On the restoration of the Bourbons he was created a peer, and in July 1815 was appointed war minister. He d. at Hyères (Var). Besides his military career, he was the author of many works of value, notably of *Mémoires pour l'histoire militaire sous le directoire, le consulat, et l'empire* (1831). See Gay de Vernon, *Vie de Gouvier Saint-Cyr*, 1857.

Govan, former burgh of Lanarkshire, Scotland, on the S. bank of the Clyde, since 1912 a suburb of Glasgow, with which it is connected by railway and electric tramways. It owes its importance to the shipbuilding and other industries of the Clyde, and possesses some of the largest shipbuilding yards and engineering works of the Brit. Isles. Elder Park is situated here. Its pop., prior to its incorporation in Glasgow, was over 90,000. It sends one member to Parliament.

Government implies sovereignty, and the sovereign is defined by Austin to be the person or persons vested with the supreme authority in an independent political society. Such a society is a state and in every state there must be a sovereign power which exercises and controls the functions of G. and conducts and regulates the relations of that political society with other political societies. A single ruler, where there is one, is called the sovereign: the body of rulers, where there are sev., is called the sovereign body of the G., or the supreme G. The rest of

the members of a political society are called the subjects.

Origin of Government.—The whole subject of G. has ever in the past been productive of what now, in the light of evolution, may be justifiably characterised as sheer dogmatism and *a priori* assumption. Probably no more remarkable theory of political societies has ever been put forward than that of the social compact. This theory with different philosophers and politicians assumes the formation in some remote period of the past of an original compact whether between the governor and governed, or between all the subjects exclusive of the governor or ruler, whereby it was mutually agreed to surrender all the sovereign powers to a sovereign or a sovereign body for the benefit of all. The theory in its various forms was a reaction against the absolutism of the equally dogmatic patriarchal theory of the origin of G. With Hobbes the social compact was useful in getting rid of the theory of the erection of political societies on a basis of force: a theory which, as it evolved the state from a delegation of 'permanent and inexpugnable power' to the sovereign, gave no room for the existence of justice and moral obligation. Locke reverted to the theory of Althusius and assumed the prince or other ruler to have been a party to a contract by which the sovereign agreed to govern according to the laws and for the public good, while the people on their side agreed to obey so long as the prince remained faithful to his part of the bargain. With Rousseau the theory underwent a radical change. He rejects with indignation the idea of a bilateral contract between sovereign and people, and postulates a literally social compact. His theory was the revolutionary expression of equality, while those of the Eng. philosophers were eminently consistent with either an aristocratic or monarchic form of G. The doctrine of Rousseau bound all to all and allowed society to exist solely by reference to this free convention of associates. Such a theory is justifiably described by Prof. Holland as no more than 'a dangerous truism.' Bentham's utilitarian analysis of the origin of G. by reference to the 'immense interest which men have in maintaining a government' assumes a similar historical basis. Every form of this theory of the genesis of G. makes the capital error of regarding a political society or state as a conscious human contrivance, as against its far more probable evolution from natural causes. The merit of the theory, however, is neatly expressed by Whewell as 'a convenient form for the expression of moral truths,' and, indeed, it is not to be supposed that all of its exponents necessarily put it on any higher plane. Whether any really satisfactory theory of the origin of G. has ever been put forward is a matter rather to be referred to individual opinion. Spencer advances the idea of the evolution of political power and institution by a process determined by conditions to the entire exclusion of intentions, the prin. condition being war. Jenks

thinks there is not the slightest difficulty in proving that all political communities of the modern type owe their existence to successful warfare, and as a natural consequence are forced to be organised on military principles. Maine, harking back to the patriarchal theory, sees the microcosm of the state in the family, expanded and developed into clans and tribes. Seeley inclines to a similar idea of insensible gradations, but regards tribal communities as in themselves states or political societies. He seems to be justified in regarding all political society proper as arising out of some external pressure, e.g. to repel a common foe or to uphold a common religion or superstition. McLennan and Morgan of the earlier school of evolution conceive of large hordes of people existing as groups anterior to the family as imagined by Aristotle, Maine, and others; but they do no more than bring the family one or two steps forward in chronological order and hardly claim to do more than examine the origin of primitive society in general. There are other theories of the origin of G., notably the eccles. notion of G. by divine appointment, but this, like the philosophical suggestions of the origin from a social compact, involves assertion which, however consistent they may be with the external phenomena presented by a modern form of G., derive therefrom not a scintilla of positive proof.

Forms of Government.—Aristotle and most later writers have classified the regular forms of G. into (1) monarchy, or G. by a single person; (2) aristocracy, or G. by a select council; (3) commonwealth, or G. by the many. Corresponding to these terms are the forms of tyranny, oligarchy, and democracy, each with a depraved connotation; but the term democracy has long since virtually displaced commonwealth as the description of a republican polity without connotation of praise or blame. It is to be noted, however, that the term democracy is confounded with corrupt plutocracy by the modern totalitarian propagandists. Blackstone wrote that in a democracy public virtue was more likely to be found than in either of the other forms of G., that in aristocracies there was more wisdom but less honesty than in a republic, and less strength than in a monarchy; and that a monarchy was the most powerful form of any, because the legislative and executive powers were united in the hand of one prince. But a hybrid and paradoxical form of G. like the limited constitutional monarchy of the Brit. Empire presents features which are not readily susceptible of such orthodoxy, while the republican G.s. of the U.S.A. have been characterised by no little corruption, much wisdom, and great strength. Prof. Seeley's classifications of societies into tribal, theocratic, and states proper, with an elaborate classification of states by reference to the proportional weight or distribution of governmental authority as between the locality and the central body, is infinitely more in accordance with modern facts. It is obviously immaterial

how G.s. may officially designate themselves, if in substance they do not conform to set patterns. Seeley, like Bluntschli, rejected the Aristotelian classification as useless, because it inquires after one feature only, viz. that of the number of rulers, and results therefore in classifying together states of an otherwise totally dissimilar nature. As a scientist should, he omits all politico-ethical considerations, regarding both state and G. not as contrivances of the conscious human will, but as instinctive natural growths. He adopts many cross-divs. of states based on various considerations, particularly in regard to the degree of local G. and the curtailment of liberty in special directions; liberty in this connotation being primarily freedom from over G., and secondarily as an equivalent to parl. or responsible G. Such divs., if a little bewildering, do undoubtedly conduce to a clearer understanding of the characteristics of different kinds of G. Modern writers, however, are not prone to adopt any classification of forms of G. beyond that into parliamentary and non-parliamentary (see CABINET), or some other div. designed to bring into prominence the degree to which the principles of representation may obtain. With the same idea G.s. are also referred to as autocratic or constitutional. The anc. Greek states were at first truly democratic; but the later communities were in the truest sense self-governed, and there never has been so close an approximation to the literal ideal of democracy as the Gk. city state, where every citizen took his turn at the proper business of G. In ancient Rome the G. was, under the kings, the monopoly of an exclusive caste of citizens; while in the later days of the republic was presented the spectacle of the inhab. of one tn. wielding the resources of a world-wide empire. On the estab. of the empire Rome in its declining days fell under the extreme autocracy of Cæsarism, where, in Lord Gowrie's words, 'the Master of the world posed as the humble servant of a mortal state,' but in reality exerted complete authority through the military despotism of Rome. In the earlier days of England the feudal form of G. was in its essentials autocratic, but the mutual contractual relations between the king and his vassals, and between the latter and under-tenants, soon paved the way to a system of representation (see ELECTORATE).

Up to the time of the First World War Russia and Turkey were commonly regarded as being under autocratic forms of G., and post-war developments in those two countries seemed only to emphasise this position. But while the Ottoman Empire, till comparatively recent times at all events, lagged far behind the rest of Europe in its adherence to a despotic form of monarchy, the Russian autocracy evolved itself into G. by depts. or a bureaucracy (q.v.). At the present day in Turkey all sovereignty belongs to the Grand National Assembly, but the Soviet G. of Russia is even more autocratic than the Tsarist G. Most G.s. of the day are constitutional in form, and as such subject

to varying degrees of popular control. The essence of a constitutional G. is that the executive powers are limited by legal restriction contained in some written or conventional constitution, and such prerogative powers as may remain to it are, in reality for the most part, popular privileges. Constitutions (*q.v.*) are said to be either rigid or flexible: rigid constitutions are written documents containing fundamental laws or legal principles which cannot be changed otherwise than by some exceptional procedure; a flexible constitution is one, like the Brit. constitution, which recognises no difference between constitutional and other laws, but permits the legal sovereign Parliament to change them at will. Practically, however, there exist in flexible constitutions principles which no Parliament would undertake lightly to alter. Most of the great nations of the day, except Great Britain, have adopted rigid constitutions, under which the rights of the subject are expressly guaranteed by the G. The common element of all constitutional forms of G. is that the sovereign legislative powers are really exercised by assemblies of a popular and elective character. In most federal nations the functions of G. are divided between the central G. and the constituent states, there being in most cases written constitutions strictly defining the powers of the former and leaving to the latter all such powers as are not thus expressly taken away. This is so in the U.S.A., but in Canada the authority of the dominion Parliament is indefinite, while that of the provs. is defined. The Swiss Federal Assembly, like Congress, can legislate only on a limited number of matters, and it has no power of annulling laws passed by the different canton Gs.

Totalitarian Government.—Totalitarian G. is a modern variant of dictatorship and, as exemplified in Fascist Italy, Nazi Germany, Communist Russia, and Falangist Spain, has its own variants. In ancient republican Rome there were periods when the absolute rule of a person or group, without the necessity of the consent of the governed, prevailed and the term dictatorship dates from this time, when in an emergency a man might be appointed dictator by the Senate for seven years and held absolute power for that term after which he had to retire and constitutional rule was restored. Modern dictatorship is either personal or that of a group or class—military or proletarian—though even in the latter case it is commonly embodied in the person of a leader. Until the emergence in the inter-war period of the totalitarian Gs., it was axiomatic that most (*i.e.* of the day) were constitutional and more or less democratic as opposed to authoritarian. The total states of Germany and Italy were the antithesis of constitutional and democratic states. In them unconstitutional forms were abolished and G. was the function of a dictator and his clique—in short, the totality of powers, executive and legislative, were vested in a dictator or leader, while in the constituent states or provs. delegated powers were given to dist.

leaders. The cardinal feature of a totalitarian state is the single-party system of G. as opposed to the liberal conception of G., which assigns to the State only certain conventional spheres of control while leaving as many as possible of the residuary powers to the free decision of the individual. The 'total state' extends the sphere of state influence over the whole of life, both private and public, and exacts subordination of the individual to the demands of the State. Thus in Germany the Nazi party, in Italy the Fascist, in Russia the Communist, and in Spain the Falangist are or were the only political parties permitted. Denazification in post-war Germany, and the liquidation of the Fascist party in Italy during the Second World War, have abolished the totalitarian system in those countries, but the Falangist party still exists in Franco's Spain, while in Russia the Communist party still holds undisputed sway.

Functions of Government.—These are threefold: (1) legislative; (2) judicial; (3) executive or administrative. The first is concerned with the making and altering of laws, the second with the interpretation and application of those laws, and the third with the carrying those laws into effect. In a narrower sense G. is identified with the executive, and this is really the modern connotation of the term. In most states these three functions are vested in separate entities, but in some cases, *e.g.* in certain crown colonies, all or the first and last may be vested in a single person or body of persons. The Brit. Cabinet illustrates in a striking manner the narrower sense of G. as above indicated. All the most important and far-reaching legislative measures of recent years have been introduced into Parliament by responsible ministers, and the skill, tact, and ingenuity of those ministers in 'piloting' their Bills through the Lower House, coupled with the fact that the Parliament Act has virtually abolished two-chamber G., so identify these measures with the ministry that the remaining members of the House of Commons more and more assume the rôle of an automatic voting assembly, the majority in which is pledged to support the ministry of the day. Where, however, the ministry really reflects the opinion of the majority of the electorate, the principle of representative G. is in no wise disturbed, and it can hardly be doubted that the strong cohesive action of a unanimous Cabinet, faithfully endeavouring to interpret the popular will, does make for efficiency and dispatch in the functions of G.

After the First World War the intrusion, in Great Britain, of the G. in the economic sphere was accentuated by the policy of 'reconstruction'—a policy which appeared to be warranted by the spectacle of a world disorganised by the necessities of war. In the years immediately following the war it was suggested by some Eng. statesmen and publicists that the experience of the war revealed in England the essential weakness of the old Cabinet system. Lord

Curzon, a great authority, declared that the old system had irretrievably broken down both as a war machine and as a peace machine (House of Lords debate, June 19, 1918). He predicted that in future the presence of other ministers than Cabinet ministers at Cabinet discussions would become an inevitable feature of Cabinet procedure and that the system of devolution and decentralisation of G. work would be considerably developed. Yet by 1920 the Cabinet once more consisted in the main of departmental ministers; its numbers had not been substantially reduced, and the principle of collective responsibility again prevailed. The experiments of the War Cabinet and the Imperial War Cabinet, effective in the time of war, did not become, as was hoped by Lloyd George, 'an accepted convention of the British constitution' (see also CABINET, IMPERIAL WAR). In 1917 a committee was appointed by the minister of reconstruction to inquire into the responsibilities of the various depts. of the Central Executive G. This 'machinery of G. committee' under the chairmanship of Lord Haldane (q.v.) suggested in its report that the business of the various depts. of G. should be distributed as far as possible according to the nature of the service with which they were concerned: and on that principle it was proposed to reduce the number of depts. and simplify the functions of the State, but to increase the number of ministers. The weakness, however, of this report was that it contemplated the intrusion of the State into every corner of social and industrial activity, and it is hardly a matter for surprise that the proposals were not implemented, though two new depts. of state, the Ministry of Transport and the Ministry of Labour, were created. In time of major wars private enterprise is bound to prove entirely inadequate to the enormous strain on its resources. Governmental control is the only way of salvation, and when the Second World War broke out a number of new ministries were quickly set up, including Ministries of Information, Aircraft Production, Home Security, Supply, Shipping, and Economic Warfare (or Blockade).

Science and Government.—A consequence of two world wars is the accelerated evolution of G. machinery for the promotion and use of scientific knowledge. Up to the outbreak of the First World War the only notable interventions of G. in the scientific sphere were the foundation of the National Physical Laboratory, the formation of the Development Commission, and the setting up of national research institutes. The need to apply scientific knowledge to everyday affairs became acute after 1914 with the necessity to develop new methods for war requirements, and a committee of the Privy Council for scientific and industrial research was appointed in 1915 and, in 1916, a Dept. of Scientific and Industrial Research. Then in 1920 the Medical Research Council was estab. to administer funds accumulated out of the operation

of the National Insurance Act, 1911, and in 1930 was set up the Agric. Research Council. The appointment by the G. after the Second World War of the Advisory Council on Scientific Policy was a further significant recognition, through war experience, of the fact that scientific knowledge and method must be considered in the direction of national affairs. The existence of this council, together with that of the newly estab. Defence Research Policy Committee, indicates that to-day the advice of scientists, like that of economists, is now recognised as being of immediate importance in the formulation of general national policies no less in peace than in war. To-day the Dept. of Scientific and Industrial Research maintains, in addition to the National Physical Laboratory, which acts both as a central bureau of standards and a research laboratory of applied physics, a building research station, a chemical research laboratory, food investigation institutes, a forest products research laboratory, a fuel research station, the geological survey, a radio research laboratory, and others, all of which are concerned not so much with basic research as with the development to some practical end of fundamental discoveries and ideas which have normally developed out of an academic environment.

See also INDIRECT RULE.

*See H. Finch, *Theory and Practice of Modern Government*, 1932, and *Future Government*, 1946; E. P. Benn, *Modern Government*, 1936; J. T. Shotwell (ed.), *Governments of Continental Europe*, 1940; W. A. Robson, *The British System of Government*, 1940, 1948; J. J. Clarke, *Outlines of Central Government*, 1944; and R. M. McIver, *Web of Government*, 1947. See also bibliography of CONSTITUTION.*

Governor's Island, is. belonging to the U.S.A., in the R. Mississippi, situated between Rock Is., city and Davenport, containing arsenals and armouries.

Governor, Colonial. The king is represented in the colonies by G.s. appointed by commissions under the Royal Sign Manual conferring upon them their powers, together with instructions defining their duties. G.s. are appointed during the royal pleasure, but do not generally retain office for more than five or six years. The extent of the powers and duties of a G. varies with the constitution of the colony. In self-governing colonies, which have attained dominion status and are no longer styled colonies, the G. is called a governor-general and is in the position of a constitutional monarch who acts on the advice of responsible ministers; but in the case of crown colonies (q.v.) the G. is an autocrat exercising both legislative and administrative powers subject only to the control of the Colonial Office. *Inter alia* the powers and duties of a G. are (1) To assent to, or withhold assent from, Bills passed by the local legislature, except in certain cases such as currency, army and navy, and foreign treaty matters, where he must reserve them for the royal assent (see COLONIAL LAW);

(2) to pardon criminals and remit fines and penalties; (3) to issue warrants for the expenditure of public money; (4) to appoint and dismiss public servants; (5) to grant licences for marriages, letters of administration, and probate of wills; and (6) to defend the colony against external aggression. A G. is entitled to obedience and assistance from all civil and military officers in the colony. He is not entitled to leave the colony without royal permission. He has no authority over Brit. ships, but should he require their assistance he must communicate with the Colonial Office save where the lives of Brit. subjects are endangered, when he may ask for such assistance directly from the navy. The celebrated cases of *R. v. Wall* and *R. v. Eyre* establish that a C. G. can be tried in England for crimes committed in the colony in his official capacity. See C. J. Tarring, *Law relating to the Colonies*, 1893, and D. Chalmers, *Outlines of Constitutional and Administrative Law*, 1910.

Governor-General. The status and functions of a Brit. G.-G. have been radically changed as a corollary to the altered status of the great self-governing dominions. The Imperial Conference of 1926 made an important declaration through the report of its Inter-Imperial Relation Committee, to the effect that the G.-G. of a dominion was now the representative of the Crown, holding in all essential respects the same position in relation to the administration of public affairs in the dominion as is held by His Majesty the King in Great Britain, and that he is not the representative or agent of His Majesty's Government in Great Britain or of any dept. of that government. This declaration necessitated a change in the procedure for the appointment of G.-G., and accordingly the Imperial Conference of 1930 arrived at the following conclusions: (1) the parties interested in the appointment are the king and the dominion concerned; (2) the constitutional practice that the king acts on the advice of responsible ministers applies in this instance; (3) the ministers who tender and are responsible for this advice are the ministers in the dominion concerned; and (4) the ministers tender their formal advice after informal consultation with the king. The conference also declared that the channel of communication between the king and the gov. of any dominion was a matter solely concerning the king and such gov., and they recorded that the gov. in the United Kingdom had expressed its willingness to act in relation to any of the king's gov.s in any manner in which that gov. might wish. Finally it was declared that the manner in which the instrument containing the G.-G.'s appointment should reflect the principles accepted by the Imperial Conference was a matter for the advice of the ministers in the dominion concerned. The position now therefore is that the home gov. is not consulted, though the appointment of the Earl of Clarendon in S. Africa in 1929 and Mr. Tim Healy in Ireland two years

previously seemed to show that the home gov. still retained a share in the advice to be given to the king. At all events the constitutional functions of the sovereign remain unimpaired by the changes. The old aspect of the royal prerogative is unchallenged, and the king can approve or reject any nomination. The G.-G. having ceased to be the channel of communication between gov. and gov., consideration was given to the question of securing some kind of representation of the home gov. in the dominions, and the most natural solution was the appointment of a high commissioner to correspond with the dominion high commissioners in London. The first dominion to receive such a representative was Canada (Sir Wm. Clark, 1929). Later high commissioners were appointed in Australia, the Union of S. Africa, and New Zealand. A United Kingdom representative was appointed to Eire in 1910, but, by way of concession to Irish prejudices, was not styled 'high commissioner.'

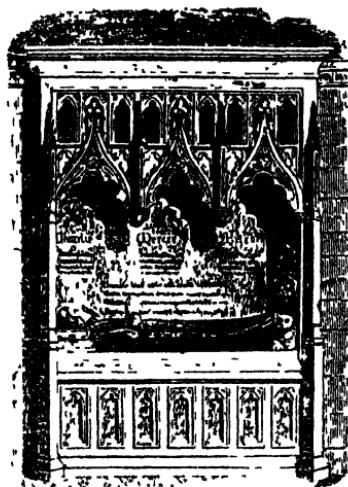
Goward, Mary Ann, see KEELEY, MARY ANN.

Gowbarrow Park, estate in Cumberland, England, N. of Ullswater, on the slopes of G. Fell. The property of the National Trust, it contains the beautiful waterfall of Aln Force and Aln Crum (1579 ft.). Area 744 ac.

Gow, Neil (or Niel) (1727-1807), Scotch violinist and composer, father of Nathaniel (1766-1831). He was early reputed to be the best performer of reels and strathspeys in Perthshire, and noted for his skill in bowing. Raeburn frequently painted his portrait for his numerous patrons, the chief being the duke of Athol. See W. Chambers, *Eminent Scotsmen*, II., 1855, and Glen, *Scottish Dance Music*, II., 1895.

Gower, John (c. 1325-1408), one of the earliest Eng. poets, probably of good family, perhaps connected with Sir R. G., a landowner both in Suffolk and Kent. He seems to have been a personal friend of Chaucer, who called him 'the moral G.' in dedicating to him *Troylus and Cressida* (1372-86). He married late, and became blind about 1400. G. wrote three long poems, the *Speculum meditantis* (originally *Hominis*) in Fr. verse (c. 1378), found at Cambridge, 1896, by G. C. Macaulay; *Vox clamantis*, in Lat. elegiacs, 1382-84, dealing with Wat Tyler's rebellion (see Coxe's ed. for Roxburgh Club 1850), to which was added *Cronica tripartita* on Henry IV.'s accession (see T. Wright, *Political Poems*, I., c. 1855, and T. Fuller, *Church History*, II., 1655); and *Confessio amantis*, in Eng. octosyllabic verse (c. 1386), completed by 1394. First dedicated to Richard II., it was afterwards transferred to Henry of Lancaster (Henry IV. by 1399), on which and other grounds G. has been called a timid time-server. The *Confessio* was one of the first books printed by Caxton (1483). It consists of a prologue and eight books of over 100 stories taken from Ovid, Valerius Maximus, Justin, *Gesta Romanorum*, chronicles of Cassiodorus and Isidorus, Godfrey of Viterbo's *Pantheon*, and

other sources. His *Cinquantie Balades* were printed for the Roxburgh Club, 1818. His work is mostly tedious and uninspired, but he deserves respect for his painstaking if monotonous verse, and for his influence on Eng. literature down to Shakespeare's time. His tomb is in St. Saviour's (old St. Mary Overies), Southwark. See eds. of the *Confessio* by R. Pauli, 1857; H. Morley (Carisbrooke Library), 1889; T. Macaulay, *Works of J. Gower*, 1889-1901. See T. Warton, *History of English Poetry*, 1781; G. Ellis, *Specimens of Early English Poets*.



GOWER'S MONUMENT IN ST. SAVIOUR'S CATHEDRAL, SOUTHWARK, LONDON

1. 1790; J. Lowell, *Conversations on some of the Old Poets*, 1845; F. W. Snell, *The Age of Chaucer*, 1901; and G. C. Fox, *The Medieval Sciences in the Works of Gower*, 1931.

Gower, or Gwyr (crooked), peninsula in Glamorganshire, Wales, situated between Swansea Bay and the Burry Inlet. Its rocky coastline is principally composed of limestone, with numerous caves, and the scenery is magnificent. Thurba Head is the property of the National Trust. In the eleventh century it was overrun by the Normans, who built castles and churches; in the reign of Henry I. it was inhabited by the Flemings, the descendants of whom still live there. It contains picturesque ruins and supposed Druidical remains. Pop. of G. rural dist., 10,000.

Gowhatta, see GUAUATI.

Gowrie, Carse of, see CARSE OF GOWRIE.

Gowrie Conspiracy, mysterious event in the hist. of Scotland, which took place in Aug. 1600 and resulted in the slaughter of the earl of G. and his brother by the attendants of James VI., afterwards James I. of England, at G. House, Perth.

John Ruthven, third earl of G., and his brother, Alexander Ruthven, were, at the time, living on the earl's estate at Perth, and early in Aug. the king, with a few attendants, visited the castle to confer with the earl regarding a debt. There seems to have been ill feeling at the time between the two, on account of the earl's father having been put to death by King James for treason, and the king also owed Earl G. a large sum of money. After dinner, on the evening of Aug. 5, 1600, Alexander Ruthven is said to have taken the king to a private study, while his brother, the earl, was engaged with other guests, and here James was confronted by an armed man, who, as appeared, was none other than G.'s servant, Henderson. Alexander Ruthven thereupon drew Henderson's dagger and presented it at the king's breast, threatening to kill him on the spot if he cried out for help, but that his life should be safe if he remained quiet. He then left King James in the custody of Henderson, who professed ignorance of any plot, and at the king's request opened one of the windows, when Alexander Ruthven returned, and on seeing the king about to call for help, struggled with him. James, however, managed to reach the window and cried out 'Treason!' to his followers below, who ran up the staircase to the king's help, led by John Ramsay, afterwards earl of Holderness. They found James struggling with Ruthven, whom Ramsay managed to wound and push down the stairway, where he was subsequently killed by other of the king's followers. G. then entered upon the scene, and seeing his brother's dead body rushed into the mêlée and was killed himself. The tragedy caused intense excitement throughout Scotland, and all the details of the investigation into the circumstances were reported to Elizabeth's ministers in England. The estates of the Ruthvens were confiscated, their name and honours abolished, and the house in which the strange event took place destroyed. Those politically hostile to James said that, with the help of the court, he invented the story of a plot by Queen Elizabeth in order to cover his own fault and his design to extirpate the Ruthven family. Some colour was given to the belief by the relentless severity with which James pursued the two younger and undoubtedly innocent brothers of the earl. They both fled to England at the time; but after the accession of James to the throne, one escaped abroad, while the other was imprisoned for nineteen years in the Tower of London. The event is amongst the unsolved enigmas of hist. See J. Calderwood, *History of the Kirk of Scotland* (Edinburgh), 1642-49, and A. Lang, *James VI. and the Gowrie Mystery*, 1902, and the authorities there cited.

Goya y Lucientes, Francisco José de (1746-1828), Sp. painter, b. at Fuendetodos in Aragon. His passion for painting was awakened by a monk of Santa Fe, near Saragossa, and at the age of sixteen he was admitted into the studio of José

Luxan Martinez. Here he participated in the quarrels of painters, and after one of these street fights had to flee to Madrid. He afterwards went to Italy and settled in Rome, where he met Louis David, but in 1771 returned to Spain. His work, like his career, is wild, but is very fine in execution, and his paintings include church pictures in fresco and in oil, portraits, etchings, and engravings. G. was made *pintor de cámara* by Charles IV. In 1799, and his portrait of Charles shows that he excelled in portraiture. 'The Caprices,' 'The Disasters of War,' and the thirty-three plates of scenes in the bull-ring are perhaps his best work. See lives by A. L. Meyer, 1924, and C. Poore, 1938; also *Goya: Drawings from the Prado* (introduced by A. Malraux), 1943.

Goya, tn. and port of Corrientes, Argentine Republic, on the Rio Paraná. It was estab. in 1807 by Capt. G. It is served by the Central, Entre Ríos, and N.E. railways and is a distributing centre for agric. products and timber. Pop. 19,000.

Goyana, or Goyanna, city of Brazil, in the prov. of Pernambuco. It is a trade centre for sugar, coffee, tobacco, rum, cattle, cotton, etc. The Dutch held possession of it from 1636 to 1661. Pop. about 53,000.

Goyáz, central state of Brazil, including all the ter. between the two branches of the Rs. Tocantins and Araguaia, nearly the whole basin of the prim. one, from its origin, and the high valleys of the Paraná-Hyba-Paraná. Its climate is sub-tropical, and the soil is not very productive, though tobacco is exported. Cattle-grazing is extensively carried on, and gold, iron, diamonds, mica, and copper are mined. Neither of the rvs. between which the state lies is navigable, so the only outlet for the state is by means of mule trains until the railways are extended from São Paulo and Minas Gerais. The cap. is Juazeiro, mining tn. on the Rio Vermelho. It is the see of a bishopric and possesses a small cathedral. Pop. 28,200. State area 288,500 sq. m.; pop. 925,700.

Goyen, Jan van (1596-1656), Dutch painter, b. at Leyden. He spent the greater part of his life at The Hague, and in 1640 was elected a member of the Painters' Guild. He was one of the earliest of the Dutch landscape painters, and owing to the freshness of his colours, his sea and riv. pieces are the most valued. He also studied atmospheric effects in black and white.

Gozo Island, or Gozzo (ancet. Gaulos), Brit. is. in the Mediterranean, 4 m. N.W. of Malta. It is 9 m. long and 4 m. wide, has an area of 26 sq. m., and is composed of coralline and globigerina limestone, with tracts of marl and blue clay. The chief tn. is Victoria (formerly Rabat) and on the S.E. coast is Fort Chambray. In the Second World War Ger. air raids on the is. suffered a serious loss in the seventeenth-century (Giant's) Gwargiell Tower. It was unique in the Maltese archipelago, and was of great interest with its many stone drop-boxes, heraldic shields, and slender domed staircase tower. It was completely obliterated in 1942 to make a

temporary landing-ground for aircraft. Pop. 22,500.

Gozzi, Count Carlo (1720-1806), It. dramatist, brother of Gaspare, b. at Venice. He was a member of the Granleschi Society, which was especially zealous to preserve the ant. It. literature, and became famous for his wit by the pub. of his satirical poem *Tartana degli infissi per l'anno bisestile* (1757) and his comedy *Fida dell' amore delle tre mclarance* (1761). This latter, which was acted by the Sacchi company of players, was very successful, and led to the production of a series of dramatic pieces based on fairy-tales. Of these the best example perhaps is *Turandot, Princess of China* (1762), which was trans. by Schiller. (It. also trans. Calderon's dramas, and pub. his autobiography, which is very amusing. His dramas, though praised by such eminent men as Goethe, Sismondi, and Tieck, have long since disappeared from the stage, and are very scarce even in their printed form. See study with bibliography, by B. Cesari, 1932.)

Gozzi, Count Gasparo (1713-80), It. poet and essayist, b. at Venice, brother of Carlo. His works are remarkable for the purity of their language and the elegance of their diction. His *Sermoni* are written in the style of Horace, and *Il Mondo morale* shows the wonderful organisation of a philosophical mind. His version of Lucan, too, is remarkable, and his *Difesa di Dante* puts him in the first rank among commentators. He also acquired great reputation by the pub. of *Osservatori Veneziano*, a paper compiled in imitation of the *Spectator*. He spent some years of his life at Venice, where he was busy translating dramas (chiefly from the Fr.) for the Theatre Sant' Angelo, and he was also censor of the press in that city for a considerable period. See G. de Beauville, *Gasparo Gozzi, journaliste vénitien du XVIIIe siècle*, 1937.

Gozzoli, Benozzo (1420-98), It. painter, b. at Florence. He was an assistant of Fra Angelico, and is chiefly famous for his work in fresco. His largest and most important piece was begun in 1469, and took sixteen years to accomplish. It consists of a series of twenty-four designs drawn from Bible hist., and is in the Campo Santo at Pisa. See study by H. Stokes, 1906.

G.P.U. (Gosudárstvennoye Politicheskoye Upravlyeniye), or Soviet State Political Dept., also called O.G.P.U. The Soviet secret police, organised after the Russian Revolution of 1917, to extirpate the opponents of the Communists. At that time it was known as the Tcheka, from the initials of its former title, Chrezvychajnaya Komisia or Extraordinary Commission, which was designed with wide powers, to combat political and economic counter-revolution, espionage, and brigandage in Russia, and, indeed, through propaganda and money, elsewhere. The chairman was a member of the council of people's commissaries of the union. The legality of the acts of the G.P.U. was controlled by the attorney-general of the Soviet under a decree of the

"Tsik" or central executive committee of the union. Like the Ger. Gestapo (q.v.) the G.P.U. employed special methods to detect opposition, even to the extent of spying on the behaviour and utterances of the Russian pop. Later, when the Communists became divided against themselves, their activities were directed against the opponents of Stalin, particularly the followers of Leon Trotsky—even pursuing their victims abroad. They played a leading part in the party purges and political trials in 1936 and 1937, and controlled the forced labour camps in Russia. In 1936 they were renamed the N.K.V.D., and after the Second World War were divided into the M.G.B. and the M.V.D.

Graaf Reinet, tn. in Cape Prov., S. Africa, about 58 m. from Middelburg. It is one of the oldest tns. in the colony, and is noted for its gardens, vineyards, and choice fruit. It is also the terminus of one of the railway lines from Port Elizabeth. Mohair and merino wool are produced in the dist. Pop.: European, 4800; others, 9000.

Grabbe, Christian Dietrich (1801–36), Ger. dramatist, b. at Detmold. He studied law at the univ. of Leipzig, but soon abandoned this to devote himself to literary work. In 1817 he determined to become an actor, and wrote the drama *Herzog Theodor von Gothland*. This was not really successful, and G. went to the univ. of Berlin and passed his advocate's examination in 1821. He afterwards practised as a lawyer in Detmold. He is remarkable for his poetic genius, and his dramas contain some very fine passages, but his work is marred by indecency. His best works are *Don Juan und Faust* (1829); *Friedrich Barbarossa* (1829); *Heinrich VI.* (1830); and *Napoleon, oder die Hundert Tage* (1831) which places the battle of Waterloo upon the stage. See A. Bergmann, *Grabbes Begegnungen mit Zeitgenossen*, 1930.

Gracchus, Caius Sempronius 159–121 B.C.), younger brother of Tiberius, and like him was an ardent reformer of the wrongs suffered by the people, but went much further than Tiberius. He served as questor in Sardinia for two years, and on his return in 124 stood for the tribunate and was elected, and re-elected at the end of 123. He at once began his reforms; he procured the exile of Popillius, the consul who had proceeded against his brother's followers, and proposed a law that all who had been deprived of any office by the people should in future be ineligible for any other office; this was aimed against his brother's opponent, Octavius. By these measures he revenged his brother's death. He next struck at the power of the Senate by enacting that the *judices* should be chosen from the *equites*, not as before from the Senate, and that the Senate should decide the provs. which the consuls should have before their election. He also rearranged the whole taxation of the now prov. of Asia, and won over the Rom. mob by his corn law; by this enactment any citizen might every month buy of the State, at about half the cost price, sufficient corn for his own livelihood. To

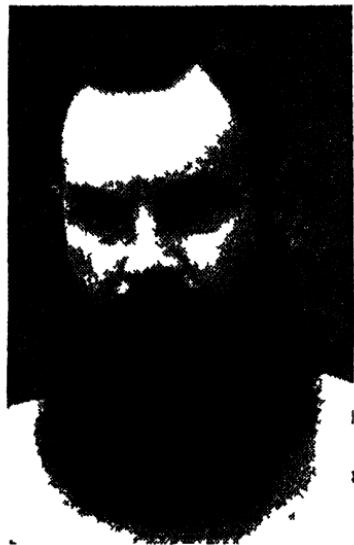
relieve the economic distress he renewed his brother's agrarian law and set on foot a scheme of colonisation, and he also proposed that the franchise should be given to all Lat. communities, and that the rest of Italy should receive Lat. rights. This last was most unpopular, and the Senate induced Lilius Drusus, another tribune, to come forward with extravagant proposals in the people's interest, proposals which could not possibly be fulfilled. The plot was successful; G. failed to secure re-election for 121; a riot followed in the Forum, and he was slain with 3000 of his followers. He was a great orator, and was the first of Rom. orators to employ violent action when speaking.

Gracchus, Tiberius Sempronius: 1. (c. 167–133 B.C.), brother of Caius and son of Cornelia, by whom he was trained after the death of his father. He was questor in Spain with the consul Mancinus in 137, and took part in the war with Numantia. In 133 he was elected tribune, and brought forward his agrarian law; it enacted that no person should have more than 500 jugera of land as his absolute property; that if he had more it should revert to the State and be portioned out in small lots at moderate rents to the poorer citizens. He also proposed to distribute the wealth of Attalus, king of Pergamus, which had just been bequeathed to Rome, among the recipients, to enable them to stock their land. The Bill met with great opposition from the Senate and capitalists, but G. succeeded in getting it passed. He was killed by a mob of senators, headed by Scipio Nasica, when he was seeking re-election. 2. (c. 210–151 B.C.), father of the tribunes and husband of Cornelia, the daughter of Scipio Africanus the Elder. He was tribune in 187, and spoke on behalf of the Scipios when they were accused of bribery after the war with Syria. In 181 he went as praetor to Hispania, and won the respect and affection of the inhab. by his strict sense of justice. In 177 he was consul, and suppressed a revolt in Sardinia. In 169 he was censor and showed himself an opponent of the capitalists, and in 163 again consul. 3. (fl. third century B.C.). Distinguished himself in the second Punic war. In 215 he defeated the Carthaginians, in 214 he was successful near Beneventum, and in 213 carried on war in Lucania. Here the next year he was betrayed into the hands of the Carthaginian Mago.

Grace, Edward Mills (1841–1911), Eng. cricketer, b. at Downend, near Bristol, third son of Dr. Henry Mills G. and elder brother of W. G.—like whom he followed the medical profession. Played at Lord's first in 1861. In Australia 1862–1861. In great international match, 1880. A famous fielder at point. Four times

Grace, William Gilbert (1848–1915), Eng. cricketer, b. at Downend, near Bristol. His father, a Gloucestershire doctor and an enthusiastic cricketer, taught the game to his five sons and four daughters in the orchard of their Downend home. His son (W. G. junior) was also a keen player. G. became famous as a

cricketer at an early age, and played for S Wales in 1864. He was very soon recognised as the best batsman in England, and took part in tours to Canada, the U.S.A., and Australia. His highest score in first class cricket was 344, while his highest aggregate for one season was 2739 made in 1871. He was also efficient as a bowler and took 192 wickets in 1875. By profession a doctor he studied at St Bartholomew's Hospital London and in Edinburgh and practised in Bristol where he captained the Gloucestershire county team till 1899. In 1879 he received a testimonial of £1400 and in 1899 a further



W.G. GRACE

one of £1000. On the house where he was born is a small tablet with the name, date of his birth and death and the words 'The World's Famous Cricketer, W.G. Grace' 6 ft 2 in tall. He rode to hounds, went beagling, built up a large practice as a doctor and enjoyed smoking and drink moderately. His biographies have never suggested that he was an intellectual. Indeed, he considered reading a waste of time. In fact he lived largely for cricket from his youth and early toured Canada with an eleven. He published in 1891 and also wrote *Cricketing Reminiscences* (1899) and *W.G.'s Little Book* (1909). See B. Darwin, *W.G. Grace* 1948.

Grace (Lat. *gratia*, *gratioso*, favour). In Christian theology *G.* conveys the notion of a favour or benefit, freely bestowed by God whose relations with the human race are distinguished into (1) those in which He acts as creator and sustainer of the universe and mankind in particular, (2) those in which He bestows

favours on us which are above our natural condition, and to which therefore we have no strict claim. It is to this latter class of God's benefits that *G.* refers. In the N.T. it refers particularly to the act of redemption performed by Christ and to the application of that redemption to the individual. The precise manner in which it operates has been the subject of controversy among theologians. All agree on the necessity of *G.* for the salvation of man as laid down by St Paul who embodied the Jewish idea that salvation depended essentially on the observance of the Mosaic law. It is also generally granted that the first *G.* called sanctifying or habitual *G.* because it effects the regeneration of the soul is conferred by baptism. Those who have received this first *G.* are said to be in a state of *G.* In opposition to this is distinguished actual *G.*, i.e. those moral benefits and helps to perform good actions which a man receives in the course of his life from God. The question of how this dual *G.* concurs with the action of the free will has led to much controversy. At one extreme is the view of Pelagius (anglicized Morgan), a native of Britain c. 400, who held that without the aid of *G.* a man is perfectly able to fulfill the law of God; and that of the semi-Pelagians who taught that the first and last good actions or desires can be performed unaided by *G.* With the reformers the tendency was in the other direction and Calvin made salvation depend entirely on divine *G.* largely to the exclusion of the human will. The position of Jansen (1632-80) was akin to this. Inside the Rom. Catholic Church these diverse tendencies were represented by a Dominican school headed by Suarez and a Jesuit school founded by Molina. The general sense of the controversy may be gathered from the decision of the papal tribunal known as the *Congregatio de Gratia* (1598-1607) which decreed that Jesuits should not call Dominicans Calvinists and Dominicans should not call Jesuits Pelagians. But the concurrence of *G.* and free will remains among the thorniest questions in theology. It may be noted that the year of Grace means the date measured from the birth of Christ or Incarnation understood as the fountain head of all subsequent *G.* (*G.* is also used as the name of prayer before and after meals (cf. *gratias*, plural thanks). See I. Dorner, *System of Christian Doctrine*, iv, 1886; J. Léonard, *La Grace et la gloire* (2 vols.), 1847; van Noort, *De gratia christi* 1908; F. Brunner, *Die Mystik und das Welt* 1921; F. Powles, *Factual Grace* 1929; and *Sanctifying Grace* 1930; and K. Barth, *Collegiadenwahl* 1936.

Graces, *et ceteris* (1601-58). Spanish writer b. at Belmonte. Little is known of his life, except that he was a Jesuit of Aragon. He is chiefly famous for having followed up the affected classicism which was popular in the seventeenth century under the name of Gongarism. His chief work was *Criticón* (1651-57), which is allegorical, and which has been compared with the *Pilgrim's Progress*. Most

of his books were not pub. under his own name. Other works of his are *Agudeza, y arte de ingenio* (a manual of rhetoric); *El Héroe* (1637), which describes the qualities of an ideal man; and *El Oráculo manual y arte de prudencia* (1647), a system of rules for the conduct of life; trans. into Eng. anonymously as *Courtier's Manual Oracle* (1684), and into Ger. by Schopenhauer (1862). See study by A. F. G. Bell, 1921. 302

Gradient of a railway is the rate at which it rises or falls above or below the horizontal, and is generally expressed in terms of the distance travelled to gain or lose one foot in height. The ruling G. of a section of railway is the steepest incline in that section, and is determined by the character of the country to be traversed, as well as by financial considerations. A moderate G. is 1 in 200, while 1 in 100 is heavy. The Great W., when laid out by Brunel, had a G. of 1 in 1320 for a long distance out of London, but later engineers improved on this. The maximum G. possible depends on the climate, a dry one being most favourable; the limit is about 1 in 16.

Grading and Conditioning. Grading is the action or process of sorting goods into grades according to their quality. Conditioning, in textile industr., especially the silk trade, is the process of determining the quality and net weight of the raw material when freed from moisture and impurities, a testing of the condition of silk, yarns, or other articles. A 'conditioning house' is an estab. where such materials may be prepared and arranged and sampled at fixed charges, and an official warranty as to their condition be obtained. The term grading is also applied to foods of various kinds, such as milk, jams, etc. In some cases definitions of grading standards have been provided by statute.

Graduation, process of dividing any given scale, straight or circular, into a given number of parts. As the whole accuracy of an observation with any instrument depends primarily on the correctness of the scale in use, extremely accurate G. is an essential. It was probably the advance of astronomy that first called for a special study of this subject in comparatively recent times, and the first really important attempt to obtain special accuracy occurred in the early part of the eighteenth century. To-day the very wide use of sextants, surveying, and astronomical instruments has demanded a very high state of perfection. Much of the work now is done by copying an accurate scale by machine, but as the copy itself has first to be constructed, it is well to deal first with *original* G. The scales in use are of three kinds: straight, arcs of circles, and complete circles; and in the last two cases the G. is in degrees and fractions of a degree. In nearly all cases, so far as is possible, the method of continual bisection is adopted. By the methods of pure geometry it is possible to bisect an arc, and to divide a line into any given number of parts, but in actual practice these are found to be far

too clumsy and inaccurate. In graduating a straight scale, the whole length is accurately laid down, and is then bisected as follows: Any arc as nearly as possible equal to half the length is laid off from each end (by means of a beam compass), and if the marks coincide the middle point is found; but if not, as is nearly always the case, the short distance is bisected accurately by hand with the help of a lens. Each part in turn is then bisected, and so on. If necessary the subdivisions in their turn must be bisected or quincuagintaed until the required marks are obtained. An alternative method is known as 'stepping,' by which the required div. is taken and marked off successively by the use of spring dividers. Obviously if any error is made in the original div., this is multiplied at each successive div. The points may, however, each be altered by use of a dividing punch, but much alteration is very undesirable.

The G. of circular arcs employs the same method. The arc of the circle itself on which the graduations are to be made is first laid down, and an arc of the same radius laid off along it to give 60° . This is bisected, giving 30° , and half the arc laid off on the other side of 60° , giving 90° . Each div. is bisected, then trisected, giving marks of 5° . Each is quinquecuted, giving single degrees, and each degree is twice bisected and then trisected, giving twelfths of a degree. In some cases a second scale has been graduated on an arc concentric with the first, and divided entirely by continual bisection, to act as a check. In graduating an entire circumference additional tests of accuracy may be made. Troughton first of all constructed a roller whose circumference was exactly one-sixteenth of the given circumference. The circumference of the roller was divided accurately into sixteen parts. The roller was fixed to the work by means of a framework which allowed it to be rolled round the circumference without slipping. As each div. of the roller came in contact with the work, a point was marked by the help of microscopes; and by this means the whole circumference was divided into 256 equal parts. The error of each point was then tested and finally corrected by means of microscopes with cross wires moved by screw heads at points diametrically opposite. Each of the 256 divs. was then divided into 16i equal parts with the subdividing sector, so that each final div. measured one-twelfth of a degree. When once an original scale is made, copying may be done by hand or machine. If a straight scale is to be exactly copied, it is firmly clamped to the work, the dividing square is laid across, and the marks made by means of the dividing knife. If necessary the new scale may be made proportionally larger or smaller by fixing it at an angle to the copy. The dividing square is then applied to the copy and notches made, the divs. being finally marked with the knife by applying the square to the new scale. In a similar way a circular scale may be copied. The copy is known as the *dividing plate*, and is provided with a

movable radius. But most copying at the present day is done by a machine known as the dividing machine. The new scale is firmly affixed to the dividing plate and made concentric with it. The dividing plate is then turned mechanically through small angles successively being stopped accurately by means of a tangent screw at each div. At each stop the dividing knife moving along a radius of the dividing plate, cuts a new div., and thus the new scale is quickly and accurately made. The machines at present in use contain one improvement due to Simons by which the copying is done with greater accuracy from a large circle to a smaller one.

Gradus ad Parnassum (*a step to Parnassus*), dictionary either Lat or Gk in which the quantities of the vowels are marked. It contains synonymous and poetical expressions and extracts and is most useful to students for verse composition. The first Lat gradus was pub in 1702 and was the work of the Jesuit Paul Ater.

Greco-Turkish War (1921-2). This war arose out of the Turkish refusal to accept that term of the treaty of Sévres (q.v.) which purported to mandate Smyrna to Greece. Mustapha Kemal (q.v.) after the Allies had signed the treaty (Aug 10 1920) set up *de facto* a Nationalist govt at Ankara and it once made preparations for war with Greece whose forces were in occupation in Asia Minor under Gen Paraskevopoulos. After the First World War Venizelos cherished dreams of a Magna Graecia extending over a large part of Asia Minor and the islands off the W coast of that country, and he relied to some extent on the moral and even material support of Great Britain for the realisation of this ambition. Kemal on the other hand was encouraged by the Frank in Bouillon agreement of Oct 1921 to rely on the moral support of France particularly as the somewhat mysterious Frank in Bouillon had evidently acted in a semi official capacity in lending aid to the Turks in the shape of arms. Much had been accomplished by Venizelos at the fall of King Constantine to impress the organisation of the Gk Army in Asia Minor but his power waned largely owing to the traditional love of the Gk people for their dynasty and after the death of King Alexander in 1920 Venizelos failed to secure a majority at the general election, notwithstanding the notorious fact that Gen Paraskevopoulos was in favour of further military intervention on his behalf and would procure a Venizelist majority in the polling at the front. When King Constantine I turned in 1920 to the throne, he restored to the Gk Army the officers who had been loyal to himself but retained also the pro-Venizelist officers, the result was that the Gk Army was divided in its ranks as well as in its political sympathies. It was the state of things in 1921 when on March 23, the Gks launched their offensive in Asia Minor. At first the offensive seemed to meet with a fair measure of success. In April, however the Gks were defeated

near Fakishehr and withdrew towards Ushak. The offensive was resumed from Ushak and Brusa in July and on the 20th the Gk forces were back again in Eskisehir. The Turks made a strategic retreat to the Sakaria. It, ostensibly to defend their new cap. Angora, the Gks continued to advance but hesitation subsequently marked their further movement and the Turks turning on them in Sept heavily defeated them. The Gks then retired to Eskisehir once again and succeeded in repelling several Turkish attacks at Afyon Karaissar in Oct. Winter having set in the situation remained quiet for over seven months during which time Kemal completely reorganised his army and on July 26 1922 a general Turkish offensive was begun. Through out Aug and Sept the Gks were in headlong flight Smyrna was evacuated by the Gk garrison in the latter month and was then burned by the Turks (Sept 11). Complications might have ensued at Chankuk and Ismid with the Brit forces under Sir Charles Haig in (q.v.) but the Mudanja Convention or armistice between Sir Charles Haig and the Allies, and Kemal averted further war (Oct 1922). Discussions between the Allies and Turkey were protracted and it was not until July 24 1923 that the treaty of Lausanne was signed which *inter alia* recognised Turkey's right to Asia Minor. Much light is thrown on the jockeying of manipulation to which the Gk Army had fallen in 1921 by the hist. *Towards Disaster the Greek Army in Asia Minor 1921* by Prince Andrew of Greece (1930).

Graetz, Heinrich (1817-91) German historian b. in Posen. He went to Breslau in 1842 where he met the leader of Jewish reform Abraham Geiger and was much opposed to his teaching. He himself advocated freedom of thought but did not see the necessity for freedom of ritual. He became famous by the pub. of his hist. of the Jews in 1853 which produced a greater sensation than any other Jewish book of the nineteenth century and he was recognised as a master of Jewish hist. The book is the work of genius though G. is often biased in his views and lacking in sympathy. His *Geschichte der Juden* was completed in 1871 and has been translated into many languages.

Græven, Johann Georg (1632-1703), Ger. classical scholar b. at Nuremberg, Saxony. He was historiographer royal to William III. He pub. eds. of Cicero, Herodotus, Suetonius, Catullus, and *Thesaurus antiquitatum Romanarum* (1694-99) etc.

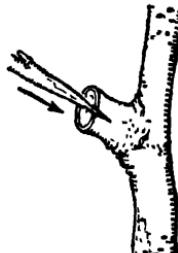
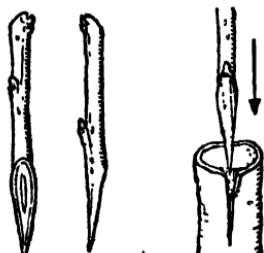
Graf, Arturo (1848-1913) It. scholar and poet, b. at Athens though of German descent. He was one of the founders of the *Giornale storico della letteratura italiana*, and is chiefly famous for his poetry. His poems are contained in *Versi* (1874), *Poesie e novelle* (1876), *Medusa* (1880 and 1890), *Dopo il tramonto versi* (1893), *Le bandidi* (1897), *Morgana* (1901), and *Poemetti drammatici* (1901), several of which have been set to music. His prose works include an

important work on *Foscola, Manzoni e Leopardi* (1898).

Graffeneire, see COMBIN, GRAND.

Grafy, Charles (b. 1862), Amer. sculptor, b. Dec. 3, at Philadelphia, son of Charles G. Educated: Pennsylvania Academy of Fine Arts under Thomas Eakins; in Paris under Chapu and Dampt. Returned to Philadelphia. Works: portrait busts; also life-size and colossal figures; ideal figures and groups—largely in bronze, e.g. 'Fountain of Man,' Buffalo Exposition (1901);

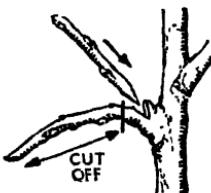
contact with those of the stork. G. is useful for various purposes, such as the rapid increase of varieties, such as roses), propagation of desired varieties on modifying stocks (e.g. fruit-trees), propagation of plant mutations or sports (e.g. fastigiate and weeping trees), imposing a desired variety upon an unwanted one, etc. The practice is old. Virgil discusses it in his *Elegies*. The methods are many. To succeed, the plant parts to be grafted must be from closely related species of the same



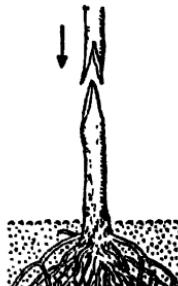
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GRAFTING

1. scion (left, scion prepared); 2. stock (stock prepared); 3. bark; 4. stub; 5. saddle.

'Symbol of Life' (small bronze); 'Mauvais Présage,' Detroit Museum; 'Vulture of War,' St. Louis Museum; 'England' and 'France,' New York Custom House; Gen. Reynolds Smith Memorial, Philadelphia.

Graf Spee, Admiral, see 'ADMIRAL GRAF SPEE.'

Grafting, gardening technique of vegetative propagation whereby a portion (the scion) of one plant is caused to grow on a root system (the stock) of another, to build a composite individual plant. The scion may be a single bud, a piece of bark including a bud, or a shoot or twig. The stock may be a stump of main stem, a branch, or a whole tree. In all cases the essential point for success is to bring the inner bark tissues or green, slimy cambium layers of cells of the scion into intimate

genus. Even then some varieties are incompatible and do not 'take' on the chosen stock. G. by budding is usually done in July-Aug. A bud is cut with a shield of bark from a well-grown, well-ripened shoot of the current season's wood of the chosen variety. A T cut is then made in the bark of the stock where the bud is to be inserted, the edges of the bark eased loose with a knife blade, and the bud slipped into position, securely tied and bound above and below with raffia, which is removed later when the bud has 'taken.' In Jan. the stock is cut down to about 6-8 in. above the bud. G. with shoots or slips is done in spring (March-April) when sap is rising. Grafts should consist of hard, well-ripened shoots of 1-2-year-old wood, preferably 1 year, cut in Nov.

and kept moist by being buried in a spade slit in a cool, shady part of the garden. The most popular methods of G. are: Rind G., where the stock is prepared by sawing and smoothing the branch, and making a vertical slit in the bark into which the freshly cut tapered end of the scion will fit snugly with cambiums in close contact. Cleft G., in which the stock is split and tapered scions fitted at each side into the split with their outer bark tissues coinciding with those of the stock. Bark G., where an angle of bark is lifted from the branch of the stock to admit a slender wedge-ended scion, fastened in place with a brad. Stub G., in which a side shoot on the stock is bent down and a cut made close to the junction of the shoot with a main branch, and into which a wedge-shaped scion is then pushed, the surplus end of the shoot being cut off. Saddle G., in which the stock is cut to a wedge and a scion of equal thickness is cut to cap it. Bridge G., chiefly used to remedy bark damage, wherein scions are prepared at both ends to slip under living bark above and below the damaged area. Tongue, whip, and shoulder G.s. are more elaborate methods of preparing stocks and scions to increase the area of contact and likelihood of success. By Approach G. or Inarching, the shoots of two plants growing in proximity can be brought together and united before the scion part is severed from its parent. This technique is useful to repair extensive bark damage to a cherished tree or to unite scions to stocks which cannot be easily grafted in the normal ways. Whatever method of G. is used, the united parts should be closely fastened together with raffia or adhesive tape and air excluded from the points of contact by smearing with G. wax or a mixture of fresh cow manure, finely chopped hay, and clay. By June or July the grafts will have taken hold and ties should be cut.

Grafting, Skin, see under SKIN.

Grafton, Augustus Henry Fitzroy, Duke of (1735-1811), politician, was a descendant of Charles II. Educated at Westminster and Cambridge, he entered Parliament in 1756, where, as Horace Walpole explains, he rose into prominence with an almost meteoric rapidity. His early promise, however, was hardly fulfilled and he is now chiefly remembered for his prudent insistence on the folly of retaining the tea and other duties levied on the Amer. colonies in the face of so sturdy an opposition. First lord of the treasury in Chatham's ministry of 1766, he became Prime Minister in the following year as the result of his leader's incapacity. But his conciliatory policy towards America was unpopular, and in 1770, after being the butt of Junius's thunders, he was glad to retire from his uncomfortable pedestal and to pursue at leisure his private amours and distractions.

Grafton, Richard (d. 1572), chronicler and printer, collaborated with Whitchurch in 1537 to produce a modified version of Coverdale's Bible, and in the following year departed to Paris in the company of Coverdale to print a revised version of the

same work. But the Inquisition pronounced the book heretical, and G. was obliged precipitately to flee to England, where he completed his task in 1539. In 1544 G. and Whitchurch obtained the monopoly for printing church service books, and at Edward VI.'s accession G. became king's printer. A number of the works he printed, including a continuation of Hardyng's *Chronicle* (1543) and Hall's *Union of the Families of Lancastre and Yorke* (1548), have come down to us, and also some of his original and contemporary commentaries.

Grafton: 1. Riv. port on both sides of the Clarence R., 342 m. N.E. of Sydney by sea, and connected by rail with Brisbane, etc., in Clarence co., New S. Wales, Australia. Sea-going vessels of moderate burdon can reach the city, which has an extensive shipping trade with Sydney. G. has both Anglican and Rom. Catholic cathedrals, and is commercially important as the centre of a fertile agric. country. Pop. of G. and S. G., 11,000. 2. Township, connected by rail with New York, Hartford, Boston, etc., 6 m. S.E. by S. of Worcester, in Worcester co., Massachusetts, U.S.A. Pop. 7100. 3. Tn. with machinery, foundry, and glass works, on the Tygart, 100 m. by rail S.E. of Wheeling, in Taylor co., of which it is the cap. W. Virginia, U.S.A. Coal-mines are at hand. Pop. 7100.

Graf Zeppelin, two Ger. airships and an aircraft carrier. The first G. Z. airship (LZ 127) was successful commercially, flying a regular service to S. America between 1932 and 1936. It made the first flight round the world in 1929, and went to the N. Pole in 1931: 772 ft. long, its five engines produced a speed of 80 m.p.h. The second 'bunched' in 1938, never came into commercial use owing to the outbreak of war. The aircraft carrier was launched in 1938 but never finished.

Graham, name of an ancient and illustrious Scottish family. The 'gallant Grahams,' as they are styled in the ballads, were Anglo-Normans who settled in Scotland during the twelfth century. 'The hardy wight and wise' Sir John de G. of Dundaff was a boon companion of Wallace, and was slain in the battle of Falkirk (1298). King Robert Bruce rewarded the loyalty of Sir David G. by granting him the estate of Auld Montrose in exchange for Cardross, and it is from this estate that the title of earl of Montrose was taken, a title first conferred on Wm. G. in 1504 as a recognition of his services at Sauchieburn (1488) and elsewhere, for all the G.s. of this period were great warriors. This Wm. was one of the 'flower of Flodden' who fell with the king, his master. The great Montrose (see MONTROSE), who was the fifth earl and first marquess, was the grandson of a distinguished G. who had been lord chancellor (1599) and viceroy of Scotland, whilst his own son was always called the 'good Montrose,' because of his gentle and peace-loving nature. The fourth marquess (d. 1712), like his famous forbear, won numerous honours. An eager upholder of the Union, he was created a duke in

1707, and in George I.'s reign became secretary of state (1717) and also chancellor of Glasgow Univ., an office held by his equally distinguished grandson, the third duke (d. 1836). Among his 'splendid employments,' which were legion, were the office of paymaster of the forces, master of the horse, lord justice-general of Scotland, and of president of the Board of Trade. Throughout his public life he followed Wm. Pitt. His son (d. 1874) was postmaster-general, and his grandson, the fifth duke (d. 1925), served in the S. African war, and from 1890 was lord clerk registrar of Scotland.

Graham, Sir Gerald (1831-99), Brit. general, entered the Royal Engineers in 1850. During the Crimean war his courage at the storming of the Redan won for him the Victoria Cross. In 1884, as commander in the E. Sudan, he was victorious at El Teb and Tamai, and the following year defeated the Arabs at Hashin and Tamai.

Graham, Sir Hugh, see ATHOLSTAN, BALKON.

Graham, James, see MONTROSE, MARQUESS OF.

Graham, John, Viscount Dundee, see DUNDEE, VISCOUNT.

Graham, Robert, 2nd Cunningham-Graham (d. c. 1797), Scottish poet, the son of Nicholas G. of Gartmore, was educated at Glasgow Univ. He went out to Jamaica and became receiver-general. In 1785 he was appointed rector of Glasgow Univ., and from 1794 to 1796 was M.P. for Stirlingshire. He was a keen Liberal and was an adherent of the principles of the Fr. Revolution. G. is chiefly remembered for his poem *If Doughty Deeds my Lady please*.

Graham, Robert (1786-1815), Scottish botanist; studied medicine at the Glasgow and Edinburgh Unive., and practised in the former tn. As a doctor he had great faith in the efficacy of drugs, such as opium and calomel, but he made his name as a botanical enthusiast, and occupied from 1820 till his death the regius professorship of that science in his native metropolis. His descriptions of newly discovered species appeared in the *Edinburgh New Philosophical Magazine*, etc., but it was in his supervision of the Edinburgh Botanic Garden that he made his influence most widely felt.

Graham, Stephen (b. 1881), Eng. novelist and travel writer. Began career as a clerk in the civil service; lived in Little Russia and Moscow among students and peasants to study at first hand the conditions of life there. In the First World War he served as a private in the Scots Guards, and the sequel to this service was the much-discussed novel *Private in the Guards* (1919), which purports to reflect the degrading influence of military discipline. His other pubs. include *A Vagabond in the Caucasus* (1911); *Undiscovered Russia* (1912); *With Poor Emigrants to America* (1911); *Children of the Slaves* (1920); *London Nights* (1925); *The Gentle Art of Tramping* (1927); *Stalin: an Impartial Study* (1931); *Life of Ivan the Terrible* (1932); *Boris Godunoff* (1933); *A*

Life of Alexander II., Tsar of Russia (1935); and *From War to War* (1940).

Graham, Thomas (1748-1843), see LYNECOCH, LORD.

Graham, Thomas (1805-69), Scottish chemist, led an exceptionally full and busy life, and yet found time to follow up a number of most valuable and original researches in his chosen science, chem. From 1837 to 1855 he was prof. of chem. at Univ. College, London, having already held, for seven years, a similar post at the Andersonian Institution of Glasgow. The most exacting of his public appointments, however, was his mastership of the mint, which he accepted in 1855 and retained till his death. It was G. who discovered the famous law of the diffusion of gases, and it was he also who estab. the polybasic nature of phosphoric acid and the formation with alcohol of certain definite salts, which he called alcoates, and which he observed were analogous to water-salts or hydrates. G. further examined the diffusibility of liquids, dividing them into crystalloids and colloids, the properties of the water of crystallisation of salts, and the passage of gases through small apertures, platinum disks, palladium, and indiarubber partitions, etc. Honours fell thick and fast upon him; his fellowship of the Royal Society dates from 1836, and he was first president both of the London Chemical (1841) and Cavendish (1846) Societies.

Grahame, Kenneth (1859-1932), Scots novelist and writer, b. in Edinburgh. Educated at St. Edward's School, Oxford, he was a secretary in the Bank of England, 1894-1908. In 1890 he pub. a satirical story, *The Headswoman*. *The Golden Age* (1895), a delicate story of childhood, achieved much popularity, but he is more famed for *The Wind in the Willows* (1908), a story of animals, treated as human beings, as popular with adults as with children, for whom it was written. (A. A. Milne dramatised it in 1930 as *Toad of Toad Hall*.) He also wrote *Dream Days* (1908). See P. Chalmers, *Life and Letters*, 1933.

Grahame-White, Claude (b. 1879), Brit. aviator; was educated at Croydon House College and Bedford Grammar School. He was one of the first men in England to own a petrol-driven car; and, after touring in S. Africa, he estab. a motor engineering business in Albemarle St. In 1910 he opened an aviation school at Pau, and also won the Gordon Bennett trophy. Later in the same year he estab. his works and school of flying at the London aerodrome, Hendon. Flight-commander, 1914. His company's premises and plant at Hendon were acquired by the gov. in 1925. In addition to pubs. in magazines, etc., he has written *The Aeroplane, Past, Present, and Future* (1911); *The Aeroplane in War and Aviation* (1912); *Learning to Fly* (1914); *Aircraft in the Great War* (1915); *Air Power* (1917); *Our First Airways* (1918); *Flying, an Epitome and a Forecast* (1930); and sev. air books for boys.

Graham Land, Antarctica, icebound tract consisting of two large and numerous

smaller is, included in the Brit crown colony of the Falkland Is. It is almost completely destitute of plant life. An expedition of research under the explorer Rymill went out to the area in 1935, and another expedition went out in 1936-37.

Graham's Dyke, Roman wall extending between the firths of Forth and Clyde.

Grahamston, small town N of Falkirk in Stirlingshire, Scotland. Pop. 9000.

Grahamstown. 1 Cap of the dist of Albany, 106 m NNE by rail of Port Elizabeth on the railway to Kimberley in the E of Cape Prov., S Africa. It lies 28 m from the coast and stands 1776 ft above sea level in healthy and pleasant situation, and was named after Col Graham, wh. in 1812, defended the region from the Kaffir invasions. It is one of the prin educational centres in the Union of S Africa and Rhodes Univ College represents an active intellectual life and there is a teachers' training college, the gov veterinary laboratory, gov herbarium, and the S African library for the blind. There are six good schools and both Anglican and Rom Catholic cathedrals. G is the centre of a large agric area. Pop 22 800. 2 G or Thames a gold mining centre 46 m ESE of Auck-land, in Thames co., N Is., New Zealand. Pop 6000.

Gratian Alps, range of the W Alps forming a boundary between Piedmont and Savoy running northward to the Col de la Signe. The highest summit Gran Paradiso (13,320 ft.) rises S of Asti in Italy.

Grail, Holy (probably from Low Lat *gradulus* *gradulus* a kind of vase or from Modern Lat *cratera* *cratula* a bowl) vessel from which Christ drank at the Last Supper and wherein the precious blood of the Saviour was received on the day that He was put on rood and crucified by Joseph of Arimathea in whose family the sacred vessel was religiously preserved. According to legend the G was taken by Joseph or his descendants to Britain. It possessed mystic properties being able to multiply bread to feed those who were free from sin to strike blind by its fulgure all those who not being pure yet looked upon it or to strike them with dumbness. The tones of the miracles which occurred in its presence, and of its quest after its mysterious disappearance throughout Christendom, abound in the romances of chivalry of the Middle Ages. Most of them have their origin in the Anglo-Norm. romance, oral or written belonging to the Arthurian cycle. The G first appears bound up with the story of *Percival le Galois* or *Perdriel*, as he is called in Welsh. Percival had been brought up by his widowed mother in complete ignorance of chivalry, but by accident he saw some knights in armour whereupon he becomes a knight errant and goes to the court of the Fisher King, the then guardian of the H G. He sees the sacred vessel, but, failing to put some mysterious question, great trouble ensues, and the G disappears. A great sorrow is befallen in the land of life through a young knight that was harboured in the

hostel of the rich King Fisherman, for that the most Holy Graal appeared to him and the Lance whereof the point runneth of blood, yet never asked he to whom was served thereof nor whence it came, and for that he asked it not are all the lands com-moved to war, nor no knight meeteth other in the forest, but he runneth upon him and slayeth him. Later Galahad plays the most important part in its quest. He, Percival, and Bors are the only knights to whom a vision of the G. was vouchsafed. The following are the sources of the G legend: (1) the incomplete *Conte del Graal*, written by Christian de Troyes (d. c. 1195), (2) the *Parzival* of the Gt. Wolf rau von Eschenbach (c. 1210) founded upon the former, and continuing it, (3) the trilogy *Joseph d'Arimathea*, *Merlin*, *Percival* of the franc comtois poet Robert de Boron, who attached the legend to the Breton cycle about the beginning of the thirteenth century, (4) the *Quête du Saint Graal*, of unknown authorship but attributed in a later form to G. tutici Map, (5) the *Saint Graal* (c. 1230), in prose founded on Boron's poem, (6) the *Mabinogi of Peredur*, a Welsh prose prose of the fourteenth century, and (7) *Sir Percival of Galles* (c. 1440), an Eng poem. The story began to be popular in England with the printing by Caxton in 1485 of Malory's *Morte d'Arthur* founded on the *Quête du Saint Graal* and Pennyson, in the nineteenth century created widespread enthusiasm for the romances of the Arthurian cycle in his *Idylls of the King*. Wagner's *Parzival* draws its inspiration from the same source. See G. Paris, *Littérature françoise au moyenâge* 1883; Newell, *King Arthur and the Round Table* (Boston) 1897; Jessie Weston, *Legend of Sir Percival* (vol. xlii.), 1906; A. Birch, *Hirselfield Du Sage nom Graal* 1877; *The High History of the Holy Graal* 1898 trans from *Percival le Galois* by Sebastian Evans (Everyman's Library), and I. Rolt Wheeler, *Mystic Gleams from the Holy Grail*, 1949.

Grain, name of the smallest unit of weight both in England and the U.S.A. The origin of the use of the word in this sense is supposed to be that it represents the weight of one G of wheat. Regarding the G as fractions of a pound the avon dupuis G and the troy G.

Grainger, Percy Aldridge (b. 1892), Australian pianist and composer, b. at Brighton, Victoria. From 1911, he has lived mostly in the U.S.A., of which he is now a citizen. Studied under Busoni. Became an intimate friend of Grieg in London in 1906 and later played Grieg's concerto at Leeds Festival at that composer's request. Performed in New York for the first time in 1915, since when he has been identified with Amer musical activities. As a composer and pianist G introduced many of his own works at the prin concerts in London and in America, and also did much to spread the works of Debussy, Ravel, Albeniz (q.v.), and other modern composers. In the *Journal of the Folk-Song Society* (May 1908, No. 12) he pub a collection of Bilt folk-tunes which have become the bases of many of his

compositions. In 1935 he applied the proceeds of a tour in Australia to the founding of a G. museum, of wide cultural range, in the grounds of Melbourne Univ. Works: (orchestral) *Molly on the Shore*, *Shepherd's Hey*, *Irish Tune from County Derry*, *Hill Songs*, *Marching Song of Democracy*, *Sir Kydmore Brig Fair*, *Morning Song on the Jungle*, and *Tiger, Tiger*. See study by D. C. Parker, 1918.

Graining, species of dace thought by Gunther to be merely a local variety, but elevated by Pennant and Yarrell into a distinct species called *Lewiscus lancastriensis*, because G. are found in the Mersey.

Gram, see CHICK-PEA.

Gramineæ, large order of plants containing grasses. It is a monocotyledonous order characterised by having leaves which are alternate and usually linear, with a long split sheath enclosing the stem; the nodes are prominent, the internodes long and hollow. The flowers, often unisexual, have no perianth, but are enclosed by bracts, termed palea, and are arranged in complicated inflorescences. Cereals are fruits of this family. Among the better known genera are *Saccharum*, the sugar-cane; *Zea Mays*, the maize; *Oryza*, the rice; *Avena*, the oat; *Bizia*, the quaking grass; *Cyperus*, the pampas-grass; *Triticum*, the wheat; *Hordeum*, the barley; *Bambusa*, the bamboo, etc. See GRASSES.

Grammar (Gk. γραμμα, letter; λαβεῖν, to write) treats of the usage of a word and of combinations of words in a language. It is an exposition of, or a treatise on, a language as it is customarily spoken among a particular people. Its function is to teach what is, not what ought to be, spoken. The first Gs. were written by the Sophists of anc. Greece, who studied the G. of their language primarily for the purpose of discovering the rules that govern the art of rhetoric. They first distinguished between the noun (*νοῦς*) and the verb (*πρᾶσις*), which together form the basis of the G. of every language. Protagoras made a further advance upon the study of the language by marking the distinction between the three genders, masculine, feminine, and neuter, and between the various verbal moods. It was Aristotle who introduced the word *κασος*, case, using it to denote any flexion whatever. Later the Stoïcs confined case to nouns. Thus the elements of G. were set forth and the parts of speech defined.

The second impetus given to the study of G. was due to the desire of studying a language unintelligible except with the aid of glosses and vocabularies. During the second century B.C. Alexandria was the literary centre of Greece. In that tn. there flourished many scholars, but there was a lack of any creative original talent. The Alexandrians consequently applied themselves to the study of the great poets of an earlier time. The Gk. language having changed in certain ways during the intervening centuries the language had to be studied in order that the poetry might be understood. Thus there grew up in Alexandria various

schools of grammarians, who studied the language of anc. Greece. Among these were Zenodotus, a native of Ephesus, the superintendent of the great library, Alexander the Aetolian, and Lycophron the Chalcidian, who were employed by Ptolemy Philadelphus about 200 B.C. to revise the Gk. poets. Later there were two distinct schools of grammarians, known as the Analogists and the Anomalists. The former was founded by Aristarchus of Samothrace (c. 220–144 B.C.), a pupil of Ariostophanes of Byzantium. This school upheld the law of analogy between the idea and the word, whereas the Anomalist denied the existence of rules except in so far as they were proved by custom and practice. Among the latter were numbered Crates of Mallus in Cilicia, who founded the famous school of G. at Pergamus. He pub. a commentary on Homer in opposition to the ed. of Aristarchus. His was the first formal Gk. G. In the following century the Romans used the Gk. Gs. of the Alexandrians; then, in comparing their own language Lat. with Gk., they came to write Lat. Gs. The Lat. G. books were modelled on that of Dionyius Thrax, an analogist. The Romans were obliged to modify and to enlarge upon existing definitions, to suit their own case. For example, a Lat. noun has one more case than a Gk. noun, namely, the ablative case, which was first defined by Julius Caesar in his *De Analogia*. The most famous grammarian of later Rome was Donatus, the teacher of St. Jerome. He lived in the fourth century A.D. The treatise formerly attributed to him on Lat. G. has formed the basis of most books on that subject, from his own time up to the present day.

Formal G. comprises morphology and syntax. Morphology treats of the forms of a language, the modifications of such forms, and the treatment of inflections, etc. In order to classify different branches of linguistic knowledge, definite nomenclature is indispensable, but has always been variable; continental grammarians are continually proposing new sets of names for even the parts of speech. Most of the common names used in Eng. G. books are derived through the Lat. from the Gk., the Rom. grammarians using, translating or mistranslating the Gk. names as they found them in Alexandrian G. books. Morphology also deals with the various parts of speech, which, according to most Eng. grammarians, are eight in number: noun or substantiative, pronoun, adjective, verb or predicate, adverb, preposition, conjunction, and interjection; and with the classifications and inflections of these. Many grammarians do not recognise the interjection as belonging to the so-called parts of speech, arguing that it can form no part of a sentence, and is nothing more than an articulated gesture. Morphology is closely related with etymology and phon-logy, for the classification and analysis of a word depends largely upon its stem and its form. It is also connected with accentuation and orthography in so far as the grammatical meaning of words is affected by a change

of accent or of spelling, as, for example, in *in'line* (noun) and *incl'in'e* (verb), and *practice* (noun) and *practise* (verb). Morphology treats of the form and structure of single words, whereas syntax treats of words in relation to other words, that is, of the arrangement of words into sentences according to the established usages of a language. Syntax is generally similar in languages belonging to the same family, though each has, of course, its own idioms. In an inflectional language like Lat. less depends on the arrangement of words as their meaning is made clear by the inflectional endings. In an uninfectional language like Eng. there must exist certain laws of position, which show the meaning of a word. For example, the word *sleep* might denote an action or a state, that is to say, it might be a verb or a noun; its meaning is made clear by its relation in a sentence to other words. Eng. syntax is usually taught in schools by means of analysing and parsing. Analysis is the differentiation of types of sentences and the resolution of a sentence, whether 'simple' or 'compound', into its component parts, whereas parsing is assigning each word in the sentence to its class as a part of speech and showing its syntactical relation towards other words in the sentence.

The rules of grammar depend upon the common practices of people, and, if these practices change, the rules become modified by the consent of the majority. The rules of Modern Eng. G. are very different from the rules of O.E. G. By a continuous process of monophthongisation, Eng. has ceased to be an inflectional language. But in order to understand fully the G. of Modern Eng., the grammarian must study the change and development of O.E. through the Middle into Modern Eng. Moreover, a language has, in a sense, as many G.s as it has dialects. O.E. had various forms, W. Saxon, Mercian, Kentish, Northumbrian, etc., the influence of the court of Alfred making W. Saxon the chief literary form. In the Middle Ages the chief dialects were E. Midland, W. Midland, N. Kentish, and S.W. Through the influence of the works of Chaucer, Eng., as now spoken and written by educated men, is a development of E. Midland. This particular dialect of Eng. has become prevalent among Eng-speaking people all over the world, and by English G. in common parlance we mean an exposition of that language as it is used by educated people. But, nevertheless, the dialects of Middle Eng. still exist in a modified form among the more unsophisticated inhabitants of Scotland, Lancashire, Somersetshire, etc. The vocabulary, use of forms of speech, and construction of sentences differ in different cos. What is grammatical to an Irish peasant would be unintelligible to a Cornish fisherman. When G. treats of the different usages of a language in different places and at different periods of time, it is known as *historical G.* Historical G. can only be studied by consulting older records and inscriptions. The G. of a language can only be traced as far back as documentary evidence permits,

and can only be continuous in a language where a succession of written records exists. The grammarian may, however, reconstruct one language by comparing its forms with those of cognate languages. Thus by comparing O.E. with Gothic and Old High Ger., and these in turn with Lat. and Gk., he would obtain some idea of the hypothetical forms of Primitive and Indo-Germanic, from which those languages are derived. This is known as the comparative method, and the system which regards one language in relation with other languages of the same family is known as *comparative G.* The object of *universal G.*, which has been called the 'metaphysics of language', is, by comparing the G.s. of different families or groups of languages, to arrive at some knowledge of the ideas that underlie all G.

See E. Mitzner, *English Grammar*, 1874; A. Schleicher, *Compendium of the Comparative Grammar of the Indo-European Languages*, trans., 1874; H. Sweet, *Words, Logic, and Grammar*, 1875-18, and *A New English Grammar, Logical and Historical* (2 vols.), 1892-98; D. Pezzi, *Aryan Philology according to the most Recent Researches*, trans., 1879; A. H. Sayce, *Introduction to the Science of Language*, 1879; F. Mauthner, *Beiträge zur einer Kritik der Sprache*, 1886-1900; H. Delbrück, *Comparative Grammar of the Indo-Germanic Languages*, trans., 1888-95; C. Abel, *Egyptisch-indoeuropäische Sprachverwandtschaft*, 1903; T. G. Tucker, *Introduction to a Natural History of Language*, 1908; O. Jespersen, *Philosophy of Grammar*, 1924; S. A. Leonard, *The Doctrine of Correctness in English Usage*, 1929; and L. Bloomfield, *Language*, 1933. See also under *Language and Literature* section of various countries.

Grammaticus, see SAXO.

Gramme (from Late Lat. from Gk. *gramma*, small weight), standard unit of Fr. measure of weight, corresponding to 15.4325 grains troy. It is the thousandth part of the weight of a litre of distilled water at 0° C. The metric system includes centigrammes, decigrammes, deca-grammes, hectogrammes, kilogrammes, and myriagrammes. Whilst the centigramme only represents 0.154323 $\frac{1}{4}$ grain troy, the myriagramme represents 154323 $\frac{1}{4}$ grains troy, which is little short of 1 cwt.

Grammichele, tn. in the prov. of Catania, Sicily, situated on the side of a hill. Beautiful marble is found in the neighbourhood. Pop. 16,000.

Grammont, see KERAARDSBERGEN.

Gramont, Antoine Alfred Agénor, Due de (1819-80), came of an illustrious family. Ambas. at Rome and Vienna, and, later, appointed minister of foreign affairs in the Ollivier Cabinet. His administration ended in disaster and led to the Franco-Prussian war.

Gramophone (phonograph, graphophone, or talking machine). The essential principles of the G. and the dictaphone are identical, and owe their origin to Edison, who invented the phonograph in 1877. This consisted of a cylindrical drum covered with a sheet of tinfoil on which rested a blunt-pointed stylus which was

fixed to a membrane situated at the base of a conical mouthpiece. Records were made by speaking into the mouthpiece; the sound waves, being focused by the mouthpiece, set the membrane vibrating sympathetically and the stylus indented the foil on the rotating drum to varying depths. Reproduction of the recording was obtained by returning the drum to its original position and turning it at the same rate as before. The stylus thus executed its former vibrations, and these transmitted to the membrane gave rise to sound-waves of the same form as the original waves. C. S. Tainter with A. G. and C. Bell improved this instrument by substituting for the tinfoil a cylindrical drum of cardboard coated with wax.

Judges of music may be said to be three-fold, viz. (i.) electrical recording, (ii.) modern technique in making copies of the original record, (iii.) modern methods of reproduction. The standard sizes of disks for domestic use are 8-, 10-, and 12-in. diameter, operating at 78 or more rarely 80 r.p.m., and having records pressed on both sides. The disks for educational sound film use, and at one time used in cinemas, are 16 in. in diameter and rotate at 33½ r.p.m., and are normally pressed on one side only.

Electrical recording followed in 1925 the invention of the modern microphone and thermionic valve by means of which it is possible to amplify the feeble fluctuations of the electric currents in the microphone



Electric and Musical Industries Ltd., Hayes

GRAMOPHONE RECORD GROOVES

Typical gramophone record grooves, magnified approximately 11 times. On an average record there are some 100 of these grooves to the inch. The white lines seen in the grooves are due to reflection of light from the walls, the grooves themselves, of course, being black like the material.

But this type of record survives only in the dictaphone, which uses semi-hard wax and in which, for office use, duplicates are not required. On the other hand, recent improvements in recording have reintroduced contour recording; and such records have been used for recording broadcasting programmes, but they are too costly for domestic use. The first disk records were invented by E. Berliner in 1887; in this form of recording the stylus travels in a spiral groove, running from the circumference to the centre of a flat wax disk rotating on a horizontal turn-table. Reproductions of sound from disk records are either mechanical (acoustic or electro-mechanical (pick-up), the former being the original method, and the latter introduced when recorded material was found to be useful for broadcasting purposes. The output of a pick-up can be amplified to any extent required, depending on the ultimate acoustic power required and the efficiency of the reproducers. Thus the improvements that, since about 1920, have made the G. an instrument acceptable to critical

circuit caused by the impact of sound waves on the microphone. Distortion is not completely absent even in the best microphones, but a corrective device known as an 'attenuation equaliser,' inserted in the amplifying circuit, reduces it to a minimum. Further, the design of studios to give the natural effects produced by reverberation in a concert hall has resulted in the great improvement of modern recording. The recorder itself is essentially an electro-magnet with a soft iron armature pivoted between its pole-pieces. The amplified microphonic currents traverse coils surrounding the armature and cause it to vibrate sympathetically between the poles of the electro-magnet. The armature carries a shaft to which is attached the holder for the stylus.

This electro-magnetic recorder is responsible for some of the improvements that have resulted in the uniform response to notes of varying frequencies. Recently a new type of G. pick-up has been developed commercially. This makes use of the piezo-electric effect of quartz or rochelle-salt

crystal when subjected to varying mechanical pressure.

Modern Technique of Record Making.—The original record is a soft wax disk. This is coated with a fine metallic powder in order to prepare it for the electrolytic bath in which copper is deposited on the record. The shell of copper thus produced is known as the 'master shell,' and it is, of course, a negative of the original record. The master shell is placed in another electrolytic bath and copper is deposited on it until a positive shell is obtained called 'the mother.' Another negative shell, the matrix, is prepared from the latter, and this, after suitable strengthening, is ready for producing the actual copies. The mixture forming the copy is heated to make it plastic, and it is then pressed on the negative by means of a hydraulic press with a force of approximately half a ton per sq. in. The final result is the positive copy. The Columbia Company in 1922 discovered that surface noise during reproduction could be almost entirely eliminated by using exceedingly finely ground material for the record surface.

Modern Reproduction.—The improvements effected under this heading include the new designs of tone arms, horns, and electric pick-ups. The chief considerations are the faithful reproduction of the original music and the amplification required for performances to large audiences. It has been found that the type of horn that gives even response to notes of different frequencies is the logarithmic or exponential horn, i.e. its longitudinal section is an exponential curve. The old external horn has now long been superseded by the internal horn or resonator.

Gramophone Pick-up (Radio).—This is an electro-magnetic device enabling G. records to be played with the aid of a suitable amplifier or the audio-frequency portion of a radio receiver and loud-speaker. The pick-up consists of a vibrating iron armature in the field of a permanent magnet. As the needle, following the sound track of the rotating record, vibrates, the armature causes variations of the magnetic flux through one or two coils of wire, and the electro-motive force so produced operates the amplifier and loudspeaker.

The word G. is a protected trade name, and the industry is a large one, owing its increasing popularity in recent years to the demand for records of dance music, while electric recording of music and speech has resulted in a much increased purity of reproduction which has also enhanced the popularity of the G. See Wilson and Webb, *Modern Gramophones and Electrical Reproducers*, 1929, and A. Wood, *Sound Waves and their Uses*, 1930.

Grampians: 1. Mt. chain composed of granite, gneiss, quartzite, marble, and schists, which separates the Highlands from the Lowlands in Scotland. The highest well-known summits are Ben Nevis, Ben Macdhui, Ben Alder, and Ben Lomond. The chief rvs., flowing from the watershed N. are the Spey, Don, and Dee, with their trib., whilst those flowing

S. are the Esk, Tay, and Forth, with their trib. The general aspect of these mts. is wild and rugged in the Highland dist., but the Lowlands afford excellent pasture. 2. Another range lies in Victoria, Australia, partly skirting the basin of the Glenelg and its trib. streams; the chief peak is the height of Mt. William.

Grampus (corruption of the Fr. *grand poisson*, Norman *grapois*, Sp. *gran pes*, It. *gran pesce*), enormous fish which is to be found in the N. seas and off the coast of Greenland. It belongs to the Dolphiniæ or dolphin family, and is the only cetacean which preys upon its own kind, the porpoise, dolphin, and whale. It is enormously strong and very voracious. Its special characteristics are the rounded head, conical teeth, and high dorsal fin. The adult G. measures from 20 to 30 ft. long, and is more than 10 ft. in girth. The upper part of the body is black, changing to white on the under surface and on part of the sides. It sometimes appears in herds numbering hundreds.

Gran, or Esztergom, cap. of the co. G., Hungary, and seat of the prince primate of Hungary. It is 25 m. N.N.W. of Budapest, on the R. Danube, and has a bridge of boats connecting it with the mkt. tn. of Parkany. The cathedral, erected in 1970, is built after the plan of St. Peter's at Rome, and occupies a commanding position on the site of what was once a fortress. G. is one of the oldest tns. in Hungary, and reputed for being the bp. of St. Stephen. Mineral springs are to be found there. Pop. 18,000.

Granada, 'Luis de' (1505-88), Sp. preacher of humble extraction, b. at Granada. His mother became widowed when he was only a child, and was assisted by the Dominicans. The boy received a good education, and after a period as page to the alcaldé, took vows at the Dominican convent of Santa Cruz at Granada. He was later on appointed procurator at Granada, and then at the end of seven years he became prior of the convent of Scala Celi in Cordova. He acquired great fame as a preacher, and was ultimately appointed confessor and counsellor to Catherine, the queen regent. He wrote two books, one on prayer, the other entitled *La Guia de Pecadores* (1556), both of which enjoyed immense popularity. See P. Rousselot, *Les Mystiques Espagnols*, 1867; also studies by F. J. Cuervo, 1919, and M. Llanza, 1926-28.

Granada: 1. Anct. Moorish kingdom of Spain, now comprising the three modern provs. of G., Almeria, and Malaga. It was the last Sp. ter. to be freed from Moorish invasion under the leadership of Ferdinand and Isabella in 1492. The modern prov. embraces an area of nearly 6000 sq. m. It is bounded by Cordova, Jaen, and Albacete on the N., and S. by the Medit.anean Sea. It is overshadowed by the lofty mts. of the Sierra Nevada, and is watered by the Rrs. Guadiana, Guadalquivir, and Rio Grande. The climate is very variable, being often almost tropical in the valleys whilst on the higher ground the temp. is freezing. It possesses a fertile soil, and there are val-

able minerals and precious stones in the neighbourhood. There are valuable iron mines and manufactures of all kinds, such as woollen, linen, cotton, soap, spirits, gunpowder, and sugar refining, which is the prin. industry. The main Madrid-Malaga-Algeciras railway passes through the cap. and there are sev. branch lines. For the events in G. of the Sp. civil war of 1936 see under SPAIN, History. Pop. 806,000. 2. The cap. of the kingdom of G. presents a curious mixture of anct. and modern architecture, and lies at the foot of the Sierra Nevada and between two hills. The oldest portion of the tn. rests on the N. hill, Alhacén, whilst the main part of the tn. lies in the plain near the Genil.



E.N.A.

THE ALHAMBRA: THE COURT OF THE LIONS

This portion of the city has a great number of buildings, principally churches, the cathedral, and a univ. Some of its buildings are distinctly oriental in character, such as the Alhambra Palace and castle of the Moorish kings. The cathedral is a Christian edifice containing the magnificent tombs of Ferdinand and Isabella, and of Philip I. and his wife. G. is derived from the word *granada*, pomegranate. Pop. 128,000. 3. Dept. and city in Nicaragua, Central America, covering an area of nearly 2600 sq. m. It lies between the Pacific and Lakes Nicaragua and Managua; although a huge plain it contains the volcano of Masaya and the Momotombo Peak. It is the terminus of the Pacific railroad. The chief products are hides, sugar, cotton, indigo, coffee. Pop. 20,000.

Granados y Campina, Enrique (1867-1916), Sp. pianist and composer, b. at Lerida, son of an army officer. Studied piano under the Catalonian master, Juan Pujol, and composition under Pedrell. His death, in the sinking of the *Sussex* by a Ger. submarine in 1916, after the production of his opera *Goyescas* in New York, gave universal prominence to his name, but more in reference to his talent as a composer than as a pianist. But in the latter capacity he was among the greatest virtuosi of any country. In his earlier compositions Grieg and Chopin

seem to be his models. In the later work the influence of Albeniz is evident. Other operas: *Pedraca*, *Follet*, *Maria del Carmen*, *Zarzuelas*, *Picarol*, *Liliiana*, etc. Also composed much dance music (*Danzas españolas*, *Danza gitana*, *Valses de amor*, *Valses poéticas*, etc.), and numerous miscellaneous compositions.

Granby, John Manners, Marquess of (1721-70). Brit. soldier. His father was the third duke of Rutland. He entered Parliament in 1741, but undertook military duties as well, taking part in the campaign of Flanders. He was appointed colonel of the Royal Horse Guards in 1758, and was present in the great action at Minden in the Seven Years war. He was eventually appointed general of the Brit. force in Ferdinand's army, where he gained great distinction. In 1766 he was appointed commander-in-chief, but he resigned his post at the end of three years owing to ill health.

Gran Canaria, one of the chief Canary Is., is of volcanic origin. Its cap. is Las Palmas (pop. 85,300). Area 65 sq. m. Pop. 180,000.

Gran Chaco (from Sp., 'great hunting ground'), vast ter. in the centre of S. America, occupying the ter. of E. Bolivia, W. Paraguay, and part of the N. Argentine republic. It may be roughly divided into three dists., the Chaco Boreal, extending from the plains of Chiquitos to the Pilcomayo (bird riv.), and consisting of giant forests. The Chuco Central lies between the two rvs., the Pilcomayo and the Bermejo (red riv.). The third dist., the Chaco Austral, lies between the Bermejo and Salado Rvs. The whole region is inundated at times to so great an extent that it presents the appearance of one vast lagoon. Indians are the chief inhab. In 1933 Bolivia and Paraguay went to war over the possession of the G. C. After four years, in which the resources of both countries, human and material, were almost exhausted, there was a truce. Neither side had won, but Paraguay appeared to have been winning. In 1938 a peace treaty was drafted, under which they agreed to accept the decision of neutral arbitrators on the question of the G. C. boundary. The treaty, which was ratified soon afterwards, gives Bolivia free commercial transit across the Chaco and free commercial entry to Puerto Casado, on the Paraguay R.

Grand, Sarah (Frances Elizabeth McFall) (1862-1943), Eng. novelist, b. in Ireland, of Eng. parents; daughter of Edward John Bellenden Clarke, Lt. R.N. Married, at sixteen, Brig.-Surgeon Lt.-Col. McFall (d. 1898). She became famous through her first novel, *Ideals* (1888). She also wrote *The Heavenly Twins* (1893); *The Bath Book* (1897); *Babe the Impossible* (1900); *Adnam's Orchard* (1912); *The Winged Victory* (1916); and *Variety* (tales, 1922). She took part in the campaign for women's rights, and also in the municipal affairs of Bath, of which city she was mayoress in 1923 and 1925-1929.

Grand Alliance, alliance signed at Vienna, 1689, by England, Germany, and

the states-general of the Netherlands to prevent the union of France and Spain.

Grand Bahama, one of the prin. is. of the Bahamas, W. Indies, in lat. 26° 41' N. and long. 79° W. It is about 70 m. long and 9 m. wide.

Grand Bank, great submarine elevation in the N. Atlantic, S.E. of Newfoundland; it is a free fishing-ground, teeming with cod and other fish. Area, about 500,000 sq. m.

Grand Bassa, seaport of Liberia, W. Africa, about 50 m. S. of Monrovia.

Grand Bassam, Fr. port of the Ivory Coast, Upper Guinea, Africa, which produces gold, palm-oil, and mahogany. Pop. 7400.

Grand Canal, The: 1. Main waterway of Venice, from which branch the lesser canals. 2. or Imperial Canal, one of the most important means of communication in China, as the roads are so defective; it is also called Yung-ho (transport), and extends from Hangchow to Peiping, covering a distance of nearly 1000 m. This canal has existed for centuries, the first section, from the Yangtsekiang to the Hwei R., being opened c. 500 B.C. The section of the canal lying between Hangchow and Yangtsekiang was constructed early in the seventh century. In the eighteenth century it was found necessary to protect the canal from sudden inundations, and for this purpose a double series of lakes was formed on the W. side of the canal to enable the surplus waters to discharge themselves and flood the land beyond. The main body of the stream empties its waters into the Yangtsekiang.

Grand Canyon, spectacular gorge of the Colorado R. in Arizona, U.S.A. The greatest of a series of such canyons, it is 217 m. in length, from 3000 to 6000 ft. in depth, and from 2 to 15 m. wide.

Grand-Combe, La., com. of France, in the dept. of Gard and the arron. of Alès. There are coal-mines, glass works, and zinc mines. Pop. 14,100.

Grand-Combin, see COMBIN.

Grand Duke, title of the sovereigns of sev. of the states of Germany prior to the revolution of 1918 at the close of the First World War. The title was also held by many members of the Russian imperial family.

Grande, Rio, see GUAPAI.

Grandet, Jean François, see BLONDIN, CHARLES.

Grand Falls: 1. Cataracts of the Hamilton, or Grand R., in Labrador, situated about 250 m. from the mouth of the riv. There are two falls, each having a clear drop of 300 ft. or more. 2. City on Exploits R., Newfoundland, founded in 1905, and engaged in the manuf. of paper. Pop. about 4000.

Grand Forks, city of N. Dakota, U.S.A., and cap. of G. F. co. It is situated on the W. bank of the Red R., opposite the mouth of Red Lake R.; it is served by two railways, and is about 55 m. N. of Fargo. The surrounding dist. is a rich wheat valley, and trade in wheat and flour is carried on. There are saw-mills, breweries, and ironworks. In 1922 the state

built a large terminal elevator and flour-mill here, and a sugar-beet factory has also been erected. On the borders of the city is the univ. of N. Dakota, opened in 1884. A trading post of the N.W. Fur Company was estab. here in 1801, and permanent settlement began in 1871. The city was chartered in 1881. Pop. 20,200.

Grand Haven, city of Michigan, U.S.A., and the cap. of Ottawa co. It is situated on Lake Michigan opposite Milwaukee and 30 m. from the Grand Rapids. It is served by two railways, by lake steamers, and by motor bus and trolley lines. In 1821 the Amer. Fur Company estab. a trading post here, and permanent settlement began in 1834. The city was chartered in 1867. Pop. 8700.

Grandi, Dino, Count (b. 1895), It. politician, educated for the law. Took part in the Fascist march on Romo. Minister of foreign affairs, 1929-32; permanent It. delegate to council of League of Nations, 1925-32; It. ambas. in London, 1932-39. Minister of justice, 1939-43. Head of It. delegation to London Naval Conference, 1936. At the meeting of the Fascist Grand Council April 23, 1943, his order of the day led to the fall of Mussolini and the Fascist regime. (G. fled later to Portugal. Pubs.: *Origins of Fascism* (1929) and *Italian Foreign Policy* (1931).

Grand Island, tn. of Nebraska, U.S.A., and the cap. of Hall co., situated on the Platte R., and served by three railways and an air service. It has an extensive trade in cattle and grain, and has a large beet-sugar manuf., besides creameries, flour-mills, marble works, etc. It possesses a college, estab. 1892, and the state Soldiers' and Sailors' Home is situated here. Settlement was begun in 1857 and the city was incorporated in 1873. Pop. 10,100.

Grand Junction, city of Colorado, U.S.A., in Mesa co., of which it is the cap. It forms an important railway junction. In the neighbourhood gold, silver, and coal are mined. It is about 200 m. W.S.W. of Denver. It was settled in 1881 and incorporated in 1882. Pop. 12,400.

Grand Jury, see JURY.

Grand Manan, is. at the entrance of the bay of Fundy in the co. of Charlotte, New Brunswick. Well known as a health resort. Greatest length is 16 m. and greatest breadth 6 m. Pop. 2700.

Grand National, Eng. steeplechase, and the prin. cross-country horse-race of the season. It was inaugurated in 1839 and takes place in March or April at Aintree, near Liverpool, on the eve of the Liverpool spring meeting. The course is 4 m. 856 yds., and includes thirty jumps. The water-jump is 15 ft. across, and other difficult obstacles are Valentine's and Becher's Brooks and the Canal Turn.

Grand Pré: 1. or Lower Horton, postern vil. in Nova Scotia, situated in King's co., 15 m. from Windsor. Stands in the midst of very fertile country. Has been made famous as the scene of Longfellow's poem *Evangeline*. Pop. 900. 2. Fr. tn. in the dept. of the Ardennes. Pop. 790.

Grand Rapids, city of Michigan, U.S.A., situated in Kent co., of which it is the cap. It stands on the Grand R. It is served by five railways and by motor coach and truck lines. The city has been much improved since 1922; roads have been widened and viaducts built to accommodate the increasing traffic, and the hill portion of the city is being laid out as an attractive residential quarter. It has a junior college and special classes for backward children. It has been under commission manager gov. since 1916. The chief industries are the lumber industry and the quarrying of gypsum. It manufactures paper, flour, hosiery, tobacco, and furniture, the latter being the chief manuf., though the manuf. of aeroplanes, etc., during the First World War has given rise to a variety of industries. It is the seat of both a Catholic and a Protestant bishop. Pop. 164,200.

Grand River, The: 1. Canada, rises in Grey co., flows S. and then S.E., entering Lake Erie after a course of 150 m. It can be used for navigation for 70 m. up, and communicates with Lake Ontario by the Welland Canal. 2. One of the head streams of the R. Colorado, U.S.A.; it rises in the Rocky Mts., and joins the Green in Utah, "w." through a very mountainous dist. Length 318 m. 3. Rises in the co. of Jackson in Michigan, U.S.A., and after flowing first in a westerly then a northerly direction, directs its course once more westward, emptying its waters into Lake Michigan at Grand Haven. It is about 300 m. long. 4. Rises in Missouri, U.S.A., and eventually joins the Missouri at Brunswick. Length 300 m.

Grand Serjeanty. In the feudal system of land holding tenure by t. s., or *per magnum servitum*, meant that the vassal held his land on condition of rendering special services to the king instead of serving the king generally in time of war. The services were always free, but were uncertain in nature. Instances of such services were carrying the king's banner or lance when he went to war, filling the post of butler, champion (officer whose duty it was to ride fully armed into Westminster Hall at the banquet, and challenge to single combat any who should deny the king's title to the crown), or other officer at his coronation. In contradistinction to G. S. was the tenure by *petit serjeanty*, where the duties or services were of a somewhat servile nature (see PETIT SERJEANTY). A rather similar tenure was that by *corouage*, where the tenant's duty consisted in winding a horn to give men warning of the coming of the Scots or other enemies.

Grand Union Canal, part of the E. portion of the canal system of Great Britain, connecting London via Northampton and Leicester to Nottingham and the R. Trent. See also CANALS.

Grandville, pseudonym of the celebrated Fr. caricaturist Jean Ignace Isidore Gérard (1803-47), b. at Nancy. Quite early in life a series of caricatures, which portrayed the woes of the small proprietor, gained him a certain amount of popularity. He

was also well known as a book illustrator; he illustrated eds. of *Gulliver's Travels*, *Don Quixote*, and *La Fontaine's Fables*. His political caricatures also came in for much praise. He d. in a mental hospital at the age of forty-four.

Granet, François Marius (1775-1849), Fr. painter, b. at Aix (Provence), son of a master builder. Learned painting in an art school directed by Constantin, a landscape painter. He became famous for Capuchin studies with striking effects of light. His masterpiece is 'Chœur des capucins de la place Barberine.' Other pictures: 'Stella dans la prison du Capitole' and 'St. Louis délivrant des prisonniers français à Damiette.'

Grange: 1. or **Grange-over-Sands**, par. and vil. on Morecombe Bay, N. Lancashire, situated about 10 m. N.W. of Carnforth. A well-known watering place, especially popular among the inhab. of Lancashire and Yorkshire. Pop. 3000. 2. Vil. of Cumberland at the S. end of Derwentwater and at the entrance to Borrowdale.

Grangemouth, seaport tn. in Scotland, in Stirlingshire, at the entrance of the Forth and Clyde Canal, about 3 m. N.E. of Falkirk. Coal is mined in the immediate vicinity. There are saw-mills and shipyards. The chief exports are pig-iron, iron ore, and timber. It has direct communication with the Continent. Docks (93 ac.) were opened in 1905. Pop. 13,600.

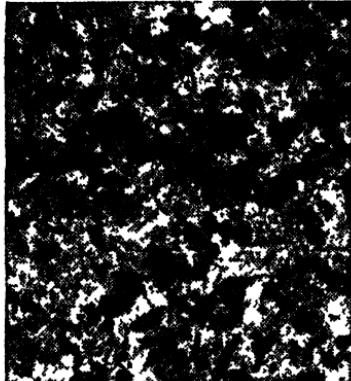
Granger, James (1723-76), b. at Shafton, Dorset, England, and took orders. He became vicar of Shiplake, in Oxfordshire. He is remembered for *A Biographical History of England* which he pub. 1769-74, and which went from the eighth to the end of the eighteenth century. The striking feature of this biographical hist. was the collection of portraits with which he illustrated his work. A continuation of his work by M. Noble appeared in 1806 in three vols. See J. P. Macleod, *Letters between the Rev. James Granger and many of the more eminent Literary Men of his Time*, 1805.

Granicus (modern *Bigha Chai*), riv. in Asia Minor. Its source is in Mt. Ida and it flows into the sea of Marmora. Here Alexander the Great defeated the Persians in 334 B.C., and it was also the scene of the defeat of Mithridates in 73 B.C. by Lucullus.

Granier de Cassagnac, see CASSAGNAC.

Granite, group name for sev. plutonic rocks which form the great bulk of the igneous rocks of all ages, and consist of a completely crystalline mixture usually of quartz, felspar, and muscovite. This last substance may be wholly or partly replaced by sev. other minerals, e.g. hornblende or biotite, or in rare cases by augite. Accessory minerals are always found, the most common being apatite, garnet, zircon, or sphene, with varying quantities of plagioclase. Sections of G. show considerable diversity of detail, but usually it is found that the quartz is a colourless transparent allomorphic substance filling the interstitial spaces between the other crystals. The orthoclase,

which is the general type of felspar present, will have a clearly marked outline, and is generally translucent, on account of more or less decomposition. The muscovite will show definite cleavage cracks, and in large crystal specimens separate flakes can be easily removed. The presence of biotite is generally indicated by glistening black particles which are readily flaked. In some specimens the crystals can only be distinguished under the microscope, and such are said to possess a micro-granitic structure. Although G. possesses at least three essential minerals, yet there are related rocks which possess two of the constituents. Gneiss is composed of quartz and muscovite, while aplite is made up of quartz and



GRANITE

The light mineral is orthoclase and the very dark mineral is black mica. The intermediate or greyish mineral is quartz, which appears dark in the photograph by reason of its transparency.

orthoclase. There is hardly any extensive region in the world in which granitic masses do not occur. To mention but a few sites: N.W. Portugal; S.W. Spain; between Dresden and Gorlitz (Zgorzele); in the Grampians of Scotland; the Lofoten islands off Norway; Corsica; Sardinia; S. chain of the Urals; S.E. across France from St. Malo towards Avignon; along the E. coast of Brazil; plateaux of S. Africa, etc. The great value of the rock is as a building material, and the fact that masses of great magnitude can be procured of perfect continuity is one of the many reasons for its popularity. For vast and massive structures intended to resist weather and violence most Gs. are admirably adapted, though in the case of those rich in potash felspar they are less valuable against weathering. The Egyptian obelisks consist of porphyries and syenitic Gs. The Aberdeen quarries yield massive blocks of stone of excellent quality, in which the chief felspar is albite (soda-felspar). The ultimate result of the disintegration of G. is to yield soils rich in plant food, and a long list of com-

pounds of which the kaolin (china clay) of Dartmoor, etc., is specially noted. See also IGNEOUS ROCKS. See G. F. Harris, *Granite and the Granite Industries*, and A. R. Warnes, *Building Stone*, 1926.

Granite City, city of Madison co., Illinois, situated on the Mississippi, about 3 m. N.E. of St. Louis. It is served by six railroads. Iron and steel goods are manufactured here, also there are car factories, syrup plants, and many other small industries. The city was founded in 1893 and incorporated 1896. Pop. 22,900.

'Granite State, The,' see NEW HAMPSHIRE.

Gran Sasso d'Italia, mt. group in the Apennines, reaches an elevation of 9585 ft. in Monte Corno, which is the highest point in the whole mt. chain. Here Mussolini was imprisoned for a month in 1944 after the fall of It. Fascism until rescued by the Germans.

Grant, Albert (1830-99), b. at Dublin, son of V. Gottheimer of London; he was usually known as Baron G. His early attempts at company promoting were enormously successful, and in 1874 he purchased Leicester Square, which at that time was practically waste land. He had this land laid out properly and presented it to the Metropolitan Board of Works for the benefit of the public. He was twice member of Parliament for Kidderminster. His later speculations were not fortunate, and he d. a comparatively poor man.

Grant, Duncan James Corroon, Scottish painter, b. 1885 at Rothiemurchus, Inverness, the son of an army officer. He was educated at St. Paul's School with the intention of taking up an army career. This was abandoned, however, and he was sent to the Westminster School of Art. He continued his studies in Italy and Paris, where in 1906-7 he came under the influence of Cézanne. This is evident in 'The Tight-rope Walker,' 'The Hammock,' and 'Dead Mimosa.' Since then, apart from travels in N. Africa, Greece, and elsewhere, he has worked mainly in London and the S. of France. He was represented in the Post-Impressionist exhibition in London in 1913, and in that year also became associated with Roger Fry in the craft-work of the Omega Workshops. G. possesses a highly cultivated decorative talent which he has put to good use in room decoration and theatrical décor as well as in designs for pottery and textiles. His reputation rests mainly on his oil paintings, which are noted for their vitality, their delightful use of colour, and the rhythmical harmony which he imparts to his subjects, whether still life, modern interiors, portraits, or scenes from classical legend. His first one-man exhibition was in 1924, and he has also exhibited in the New Eng. Art Club and as a member of the London Group. Pictures by him now in the Tate Gallery, London, include 'The Lemon Gatherers' (1908); 'Girl at Piano' (1938); 'Portrait of Vanessa Bell' (1912); and 'Haystack before Trees' (1910).

Grant, Sir Francis (1803-78), Scottish portrait painter, b. at Edinburgh. He

became an R.A. in 1851. In 1866 he became president of the Royal Academy and in the same year was knighted. Amongst the more famous of his works are an equestrian portrait of the queen and prince consort, and portraits of the marchioness of Waterford, Palmerston, Macaulay, and Russell.

Grant, Sir James Hope (1808-75), Brit. general. Brother to Sir Francis G., b. at Kilgraston, Perthshire. He greatly distinguished himself in the Sikh wars. He was of great service during the mutiny, taking part in the relief of Cawnpore and the retaking of Lucknow. Commanded the cavalry at the siege and capture of Delhi. After the mutiny had been broken he commanded the army which finally pacified India. He also took part in the Chinese war which followed the Indian mutiny. From 1861 to 1865 he was commander-in-chief of the army in Madras. See life by H. Knollys, 1894.

Grant, Sir Patrick (1804-95), Brit. field marshal, b. at Auchterblair, Inverness-shire. Entered the Bengal native infantry as an ensign and became a captain in 1832. He rose fairly rapidly in the service, and was present at the battle of Maharajpur (1843), Moodkee (1845), and Sobraon (1846). He served under Sir C. Napier in 1851, and from 1856 to 1861 he was commander-in-chief of the Madras army. In 1857 he took over the command of all troops in India, and directed the operations against the mutineers until the arrival of Sir Colin Campbell. He was governor of Malta (1867-72), made field marshal (1883). From 1874 to 1895 he was governor of the Royal Hospital at Chelsea.

Grant, Robert (1811-92), Scottish astronomer, b. at Gruntown, Morayshire. He received the gold medal of the Royal Astronomical Society in 1856 for a work entitled *A History of Physical Astronomy*. In 1859 he became prof. of astronomy in Glasgow Univ. He pub., in 1883, *A Catalogue of 6415 Stars* and, nine years later, *A Second Catalogue of 2156 Stars*.

Grant, Ulysses Simpson (1822-85), Amer. general; eighteenth president of the U.S.A., b. at Mount Pleasant, Massachusetts. He was descended from a Scottish family which had settled in Massachusetts in the seventeenth century. He was brought up on a farm in Clermont co., Ohio. He was, however, sent to West Point to the military academy there, and entered the army of the U.S.A. He was present at the battles of Palo Alto, Resaca de la Palma, and at the capture of Monterey. He was also with Scott in his Mexican campaign, being twice promoted for bravery. After this latter war he returned to the U.S.A., resigned his commission, and lived for some time on a farm near St. Louis, Missouri. On the outbreak of war in 1861 he offered his services to the Federals, and was appointed as a lieutenant-colonel to a Missouri infantry regiment. He soon proved his ability as a soldier and was made a brigadier-general. He fought at the battle of Belmont, captured Fort Donelson on the Cumberland, and made a great attack in 1863 on Vicksburg, forcing the enemy to surrender, and

took over 31,000 prisoners. He was then made major-general, placed in command of the div. of the Tennessee, and defeated Bragg at Chattanooga. In 1864 he was made lieutenant-general and given supreme command of the U.S. Army. His campaign as commander-in-chief was the bloodiest of the war. The great battles of the Wilderness, Spottsylvania Court-house, and Cold Harbor crippled the enemy, and finally the taking of Petersburg caused the evacuation of Richmond, the S. cap. On April 9, 1865, Lee surrendered the whole of his army. This practically ended the war. In the next year G. was made general, and in 1868 was elected president. At the expiration of his term of office he was again elected. In 1880 his friends wanted to have him nominated for a third term, but there was so much sentiment against this that the project was dropped. Probably the greatest event of his presidency was the peaceful settlement of the Alabama claims. When he retired from the presidency he accepted a position as a partner in a banking firm, which, however, in 1884 suspended payment, the two other partners having defrauded G. and absconded, ruining the ex-president. In the same year he commenced to write his autobiography to earn money for himself and his family. He d. in the following year of cancer of the tongue. Before his death, however, he was restored to his rank of general, which he had to resign on becoming president. See *Personal Memoirs*, and lives by J. Anderson, 1864, W. Church, 1897, and C. Atkinson, 1908.

Grant, in Eng. law, a term which, in its widest sense, is a synonym for any transfer of property. In a narrower sense it is interchangeable with 'assurance,' as meaning a conveyance by deed of lands. In this sense it connoted not only such old forms of conveyance as feoffment, and bargains and sales, but also all such existing forms as leases, charges, and settlements. In this sense, too, it was contrasted with transfer by 'livery of seisin,' i.e. by delivery of possession; practically all real property is now conveyed by deed, but formerly corporeal hereditaments in possession were transferable by mere delivery of possession, whereas incorporeal hereditaments (reversion, remainders, advowsons, tithes, rights of way, franchises, annuities, rents, etc.), not being physically capable of delivery, were said to lie in G., i.e. they were transferred by deed. In relation to *personally* (i.e. used as opposed to *gift* (q.v.), which latter term implies a transfer without consideration (q.v.).

Grantham, municipal and parl. bor. of Lincolnshire, England, situated on the R. Witham, and forms an important railway junction. The par. church of St. Wolfran is a most magnificent building, mainly in the Early Eng. style. Two libraries of the sixteenth and seventeenth centuries are preserved in the church. There are many other old and interesting buildings of note, among them Grantham House, once known as Hall Place, after its owners, the Hall family, wealthy wool merchants

in medieval times; it dates from the late fourteenth and early fifteenth centuries, and was fairly extensively altered in the eighteenth, notably the pleasant S. facade with sash windows and stone architraves. Princess Margaret, daughter of Henry VII., 'lodged' there on her way N. to marry James IV. of Scotland in 1503. It is the property of the National Trust. The main hotel of the tn., the 'Angel,' was originally a hostel of the fifteenth century, and its architecture preserves many traces of its antiquity.

The chief industries of the tn. are manuf. of implements for agric. use and malting. It also has iron foundries. The tn. is mentioned in the Domesday Book, and was originally governed by the bailiff of the lord of the manor. A mayor and alderman were granted it early in the reign of Edward IV. From 1463 to 1885 G. returned two members to Parliament, but by the Redistribution Bill of the latter year the representation was reduced to one. The tn. has a famous grammar school, founded in 1528, of which the best-known pupil was Sir Isaac Newton. There is an important R.A.F. station. Pop. 20,600.

Granton, port of Edinburgh, Scotland, situated on the firth of Forth, 2*m.* N.W. of Edinburgh, with timber yards, and printing ink and chemical works. G. was made a head port in 1860. It is served by two railway lines, and is the headquarters of sev. steamboat lines. There is a large tobacco bonding warehouse. Pop. 2500.

Granulite, name used by petrographers for two distinct classes of rocks. By Fr. geologists it is regarded as synonymous with muscovite-biotite granite. Ger. petrologists give the term to a schistose metamorphic rock consisting essentially of small irregular crystals of quartz and orthoclase with minute pale red garnets; these last may be accompanied by kyanite, zircon, sillimanite, etc. The second use of the term is more common in England and America. Savony is a typical region for Gs., which are here for the most part igneous; the 'moine gneisses' of N. Scotland related to these were originally sediments.

Granvelle, Antoine Perrenot, Cardinal de (1517-86) b. at Besançon, his father being a lawyer who afterwards became chancellor of the empire under Charles V. He studied law and divinity at Padua and Louvain, and at the age of about twenty-three became bishop of Arras. He showed himself a past master of the art of diplomacy, and became, in 1550, secretary of state. He helped to draw up the treaty of Passau (1552), and when the emperor abdicated he transferred his services to Philip II. He negotiated the marriage of Mary of England and the treaty of Cateau-Cambrésis. He became archbishop in 1560 and cardinal in 1561. For a short time he was forced to withdraw from the Netherlands, but was called from his retirement to go on a mission to Rome, the result of his mission being the alliance which overthrew the Turks at Lepanto. He presided over Naples for some time,

and had just been raised to the archbishopric of Besançon when he d. See P. Geyl, *The Revolt of the Netherlands*, 1932.

Granville, George Leveson-Gower, second Earl (1815-91), eldest son of the first earl, was educated at Eton and at Christ Church, Oxford. From 1841 to 1846 he sat in the House of Commons as member for Lichfield. He was made vice-president of the Board of Trade in 1848 and king's secretary in place of Palmerston in 1851. He was invited to form a ministry in 1859, but was unable to do so, and served as president of the council in the administration of Lord Palmerston. In 1868 he was colonial secretary in the first administration of Gladstone, and was foreign secretary in the Liberal administrations from 1870 to 1874 and from 1880 to 1885. As a politician and diplomat he had great influence, but his tenure of the foreign secretaryship gives him no marked place amongst the great statesmen of the time. See life by E. P. Fitzmaurice, 1905.

Granville, or **Grenville**, George, Baron Lansdowne (1667-1735), Eng. poet and politician, b. in Cornwall. Wrote some verses eulogising James II. on his accession, but, after the revolution of 1688, he lived in retirement for some time, devoting himself to literature. His tragedy *Heroick Love* (1694) was acted with great success. This was followed by the dramatic poem, *The British Knchangers* (1706). In Queen Anne's reign he secured a seat in Parliament and became secretary-at-war. Married a daughter of the earl of Jersey and was raised to the peerage. In George I.'s reign he was sent to the Tower on suspicion of taking part in a plot against the gov., but was released in 1717, and, later, went to France, where he lived for some years. See E. Handasyde, *Granville the Politic*, 1923.

Granville, John Carteret, Earl of, see CARTERET.

Granville: 1. Port and watering-place of France in the dept. of la Manche. It is situated at the mouth of the Boscq, on the Eng. Channel, and is fortified. The harbour is accessible to the largest vessels, and there is regular communication with the Channel Is. Vegetables, fruit, fish, oysters, etc., are exported, and shipbuilding and the manuf. of brandy, cod-liver oil, etc., are carried on. In the Second World War, after Coutances was captured by the Allies, the 7th Corps and two armoured divs. attacked S.-westward towards G. and Avranches (July 28, 1944) and the Ger. withdrawal soon became a disorderly retreat. On July 31st the 6th Armoured Div. reduced the remaining forces resisting at G. and thereafter no effective barrier lay between the Allies and Brittany. Pop. 10,100. 2. Tn. of New S. Wales, Australia, situated in Cumberland co., 12*m.* W. of Sydney. It is an important railway junction and there are iron works, flour-mills, tanneries, and kerosene works. The chief manufs. are tweed, pipes, tiles and bricks, and agric. implements. Pop. 20,000.

Granville-Barker, Harley (1877-1946), Eng. playwright and actor-manager, b. in Kensington, London, son of Albert James B. and Mary Elizabeth, daughter of an It. physician who had settled in London and changed his name from Bozzi to Granville. He made his first appearance on the stage in 1891 under Charles Hawtrey and afterwards acted in Ben Greet's and Wm. Poel's Shakespearian companies. In partnership with J. E. Vedrenne he became manager, in 1904, of the Court Theatre, Sloane Square, though he did not abandon acting, himself interpreting many leading parts in Shaw's plays. The Vedrenne-Barker partnership, which also centred in the King'sway and Savoy Theatres, not only gave London an opportunity of seeing the plays of Euripides, but succeeded also in popularising those of Shaw. G.-B.'s earlier plays included *The Marrying of Anne Leete* (1901), the story of a decadent eighteenth-century family, with woman seen, Shavian-wise, as a snare for man, yet written before G.-B. fell under the spell of Shaw's ideas on play-writing. G.-B. had first become directly acquainted with the plays of Shaw through his connection with the Stage Society—^{to} which he served as producer—founded in 1894, and nothing in his earlier years contributed more than this connection to his histrionic development and sense of dramatic values. His *Voysey Inheritance* (1905) is perhaps his greatest play; certainly it was the most successful with the public and it was revived at Sadler's Wells in 1934. Then came *Waste* (1909), a play dramatising the impact of the moral convention on the public life of a statesman—exemplars can easily be imagined from our political hist.—and it is not surprising that the censor refused a licence for it, and it is perhaps still less surprising that this refusal was the spearhead of the protest against the censorship of plays which led to the Royal Commission of 1909. In a later venture at the Savoy (1912), he produced Shakespearian plays in an original manner, notably *Twelfth Night*, the costumes and stage-setting being new in style, unobtrusive yet adequate, thus leaving the minds of the audience free to take in the play. It is not too much to say that G.-B. enabled some thousands of his contemporaries to hear, for the first time, Shakespeare as he should be heard; and, further, he prescribed the correct tempo in a Shakespearian play as in a great piece of music (A. C. Ward). The famous production of *A Winter's Tale* at the Savoy in 1912, and of *A Midsummer Night's Dream* in 1914—both of which productions roused violent enthusiasm and equally violent hostility—exemplified G.-B.'s preference for a 'conventional' *décor* to the realistic one, for the reason that a realistic *décor* tended to do the work of the actors. As he said in one of the many lectures which he delivered in univ. centres and elsewhere—he gave the funeral oration on Barrie in Edinburgh—'the foundation of the whole of the theatre is acting, and nothing else.' It was, therefore, perhaps ironic that he

himself in later life should have become a man of letters, highly esteemed by scholars, for his work in the Shakespearian field. The last of his original plays to be seen on the public stage was *The Madras House*, produced in 1910, which has been described as the most Shavian of all his plays or as a 'dramatic debate' in four various settings of middle-class home and shop. In collaboration with Bertie Thomas he wrote *The Weather Hen*, and he was part author, with Laurence Housman, of *Prunella* (1906), a fantasy. He collaborated with Wm. Archer in a book called *A National Theatre* (1907), and he pub. *The Exemplary Theatre* in 1922. His later plays included *The Secret Life* (1923) and *His Majesty* (1928). At the time of his death he had not accomplished the full task which he set out to perform in Shakespeare criticism; it was in Jan. 1946 that he produced the fifth vol. of his celebrated *Prefaces to Shakespeare*. Why he deserted the stage for this field it is hard to say; perhaps he considered that he had failed, but if so scholarship has been the gainer. In his later years he rendered notable service by translating the plays of the Sp. dramatists, Martinez Sierra and the Quinteros.

Grao, or Villanueva del Grao, maritime tn. of Spain, in the prov. and dist. of Valencia, situated on the Mediterranean, and is the port of Valencia; it has a fine beach, suitable for bathing. Pop. 6000.

Grão Pará, see PARÁ.

Grape, see VINE.

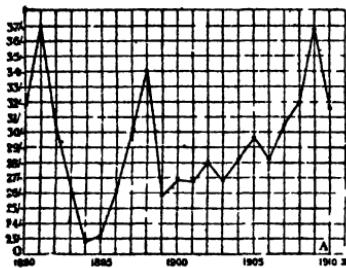
Grape-fruit, see SHADDOCK.

Graphic Arts. see DRAWING; ENGRAVING; ETCHING; PAINTING.

'Graphic,' The, Eng. illustrated weekly newspaper, founded in 1869 as a journal of independent political principles, and appealing to popular taste by reason of its photographs, original drawings of topical interest, reproductions of masterpieces of painting and drawing, and excellent serials, which were illustrated by leading artists of the day. Hardy's *Tess of the d'Urbervilles* first appeared in the *G.*, while George Meredith, Anthony Trollope, Charles Reade, Wilkie Collins, W. S. Gilbert, Lord Tennyson, Rudyard Kipling, and J. M. Barrie were also contributors. Richard Jefferies formerly provided a country-side diary. Some of its distinguished artists have been Randolph Caldecott, who contributed Christmas pictures portraying hunting squires and hounds, stagy highwaymen, finely executed sketches of life at Monte Carlo; Arthur Boyd Houghton, serial illustrator; J. E. Fenwell, the water-colour painter; Sir Hubert von Herkomer, whose 'Chelsea Pensioners' originally appeared in the *G.*; E. J. Gregory; Sir Luke Fildes, whose academy picture, 'Applicants for a Casual Ward,' appeared first as a wood-cut in the *G.*; W. L. Wyllie; Sir John Millais; George du Maurier; and Phil May. In the seventies the *G.* sent out Josephine Butler as artist-correspondent; and among other distinguished war artists of the *G.* were Frederic Villiers, Stanhope Forbes, and Sidney Hall; in 1913 some striking impressionist pictures of the Balkan war

by George Scott, pupil of Édouard Detaille, appeared under the title of 'Mud, Blood, and Silence.' Many of the greatest contributors were known during the editorship of W. L. Thomas. Some of the well-known later-day artists are Frank Brangwyn, George Clausen, Seymour Lucas, Solomon J. Solomon, Milton Fisher, Reginald Cleaver, E. T. Reed, and Lewis Baumer. In 1926 the *G.* was purchased by the Inveresk Paper Company Ltd., the resulting company being called Illustrated Newspapers Ltd. The diamond jubilee of the *G.* was celebrated by a special number on Dec. 13, 1929.

Graphical Methods of Representation, as the name implies, are methods by which varying values or estimates are placed side by side, so that their changes and fluctuations may be readily seen. Suppose, for example, we are considering the yearly average price of wheat per quarter for the twenty years from 1890 to 1910. Take for convenience a piece of squared



paper and draw two lines Ox and Oy at right angles to each other. Let each point along Ox represent one year beginning with 1890 at O to 1910 at A (see fig.). Then taking any convenient length as a standard, measure off along Oy and the successive perpendiculars to Ox lengths representing the average prices for each year in turn. By joining up the points so obtained the yearly change may be followed much more readily than from any table of figures. In a similar way the changes in any series of values taken at intervals may be graphically represented; and the method is particularly convenient in the case of economic, political, and meteorological statistics, where returns are made at regular intervals and comparison with previous returns are most important. So long as we are considering estimates for which there is one definite value for each year, the graph is obviously a complete record of fluctuations; but where we have a value which changes from day to day, for which observations are only made at longer intervals, the graph made up of a series of short straight lines is no indication of values at any time during an interval. In cases where it is practicable, where, in fact, the values do not fluctuate too abruptly, we can obtain a fair estimate of values for intermediate positions by

joining the points by as smooth and continuous a curve as is possible (see INTERPOLATION). The most complete form of graphical representation is obtained in the barograph, which traces out mechanically, in one line on specially ruled paper, every slight variation in the height of the barometer throughout the day. A drum covered with ruled paper is made to revolve regularly by means of clockwork, while a pen rising and falling with changes of atmospheric pressure traces out a continuous line.

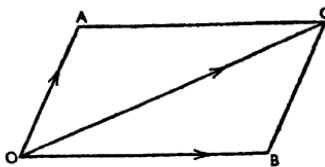


FIG. 1. VECTOR

Graphic Statics deal with the determination of stresses, tensions, etc., of frameworks and systems in equilibrium, by geometrical methods of construction. A force is completely determined when its magnitude, direction, sense, and point of application are known. It may, therefore, be represented by a straight line of definite length, drawn in a given direction through a point with an arrow head to determine the sense. This line is called the *vector*. It is proved that the resultant of two forces acting on a particle may be found by representing the forces by two straight lines OA , OB (Fig. 1), drawn through a point O , and by completing the parallelogram $OACB$. Then

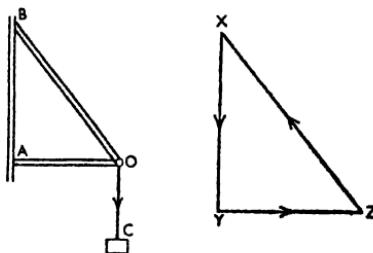


FIG. 2. TRIANGLE OF FORCES

the diagonal OC represents the resultant in magnitude and direction. It is evident that the three sides of the triangle OBC represent the three forces in magnitude and direction, though OC does not represent the point of application. Thus if we are not concerned with the point of application, the proposition (known as the *Triangle of Forces*) may be stated thus: If two forces acting at a point are represented in direction, magnitude, and sense by two sides of a triangle OB , BC , then the third side OC similarly represents the resultant. Further, the three forces

OB , BC , and CO , if acting at a point are in equilibrium. This may be extended to the *Polygon of Forces* which states that the resultant of forces represented by the lines AB , BC , CD , DE ... HK taken in order is represented by the line AK which closes the polygon. Consider first the

Take any point T on the vertical through L , and draw TU , UV , etc., successively parallel to X_A , X_B , etc., and join TY . Through X draw XO parallel to TY . Then OA and DO represent the reactions at the supports L and Q . For the stress diagram consider first the forces at L ;

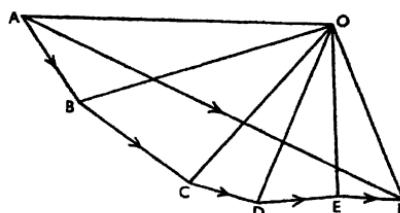
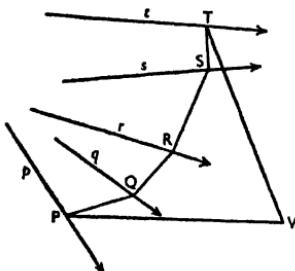


FIG. 3. LINK OR FUNICULAR POLYGON, AND VECTOR POLYGON

simple case of a load supported by a simple wall crane consisting of two bars, considered weightless (Fig. 2). The joint at O is kept in equilibrium by three forces acting along OA , OB , and OC . Draw the load line XY , vertically, to some given scale, say 1 in. to 1 ton. Through X and Y draw lines XZ and YZ parallel to BO and AO . Measure YZ and ZX and find the weights their lengths represent, and hence are found the pull which BO exerts on the pin O , i.e. the tension in BO , and the force of compression in AO .

To determine the magnitude and the line of action of the resultant of any number of forces of given magnitudes acting on a body in given straight lines. Let p , q , r , s , t be the lines of action (Fig. 3) of the given forces. Draw the vector AB to scale to represent the force along p . Similarly draw BC , CD , etc., parallel to q , r , etc., and proportional to the forces along them. Join AF and take any point O called the pole. Join OA , OB , etc. On p take any point P , draw PV parallel to AO , PQ parallel to BO , cutting q in Q . Through Q draw QL parallel to CO , and so on, finally drawing TV parallel to OF . Then the straight line through V , parallel and equal to AF , completely determines the resultant. This may be proved from the polygon of forces. The two figures are known as the *link or funicular polygon* and the *vector polygon* respectively. When the vector polygon is closed the forces are either in equilibrium or are equivalent to a couple. When the link and vector polygons are both closed the forces are in equilibrium. To find the stresses in the bars of a roof truss of the shape shown in Fig. 4, where the joints M , N , and P are loaded, and to determine the reactions at the supports L and Q . Here the vector polygon becomes a straight line called the line of loads. Draw the load line AD , AB , BC , and CD , being respectively proportional to the loads at M , N , and P . Take

OA represents the vertical force. Through O and A draw lines OE and AE parallel to LT and LM respectively. Then EO measured according to the scale will give the stresses in LR and LM . The

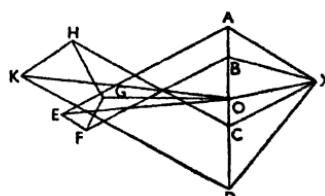
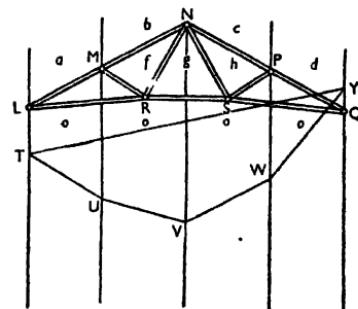


FIG. 4. DETERMINATION OF STRESSES

former is in tension and the latter in compression. Consider now the point Q . In a similar way QK is the stress diagram and OK and KD measure the stresses in QS and QP . It is now possible to consider the points M and P . At M we know already the vertical force and the stress in LM . They are represented in the stress

diagram by AB and EA. Through B and E draw BF and EF parallel to MN and MR. Then BF and FE represent the stresses in MN and MR. Similarly KH and HC give the stresses in SP and PN. For the point N draw HG and FG parallel to NS and NR. Finally by joining GO, which is parallel to RS, the stress in RS is measured and hence all the stresses are found. It is convenient to denote the spaces on the figure by small letters, which correspond to the capitals in the stress diagram. Thus AE in the stress diagram represents the stress in LM between the spaces *a* and *c*.

The shearing force (S.F.) and the bending moment (B.M.) at any section of a beam or bridge are defined as being the sum and the sum of the moments respectively of all the external forces perpendicular to it. To draw the S.F. and B.M. diagrams for the case of a beam or bridge loaded with a given weight at one point.

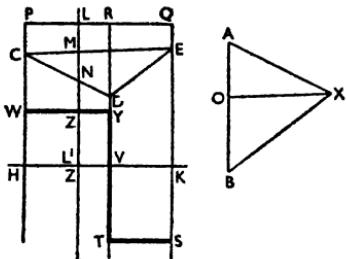


FIG. 5. BENDING MOMENT AND SHEARING FORCE

The method here given will hold equally well for any number of loads. Let PQ (Fig. 5) represent the bridge drawn to scale, and R the position of the given load. Draw the load line AB for the vector polygon. Let X be the pole at a definite distance from AB. Construct the link polygon CDE, closing it by joining 'E. Through X draw XO parallel to CK, thus determining the reactions at the ends. Through any point L on PQ draw a vertical line LMN cutting the link polygon in M and N. Measure MN and multiply it by the number of units distance of the pole X from AB. Then this product represents the B.M. at X. Thus the B.M. at any point may be found. To determine the S.F. draw any horizontal line HK to intersect the verticals PC and QE at H and K. From K measure off KS downwards along SE equal to OB, and from H measure off HW upwards along CP equal to OA. Through S and W draw ST and WY to meet RD in Y and T. Then the S.F. at L is measured by the vertical line L'Z, and similarly the S.F. at any point is measured by its vertical distance between HK and the line WYTS, thickened in the figure. When there are a number of loads this line moves upwards in a series of steps and the method is identical with the present one. For a further discussion on the subject see

G. C. Turner, *Graphics Applied to Arithmetic, Mensuration, and Statics*.
Graphite, see BLACK-LEAD.

Graphology, science which purports to reveal the psychological laws underlying the various features of handwriting. G. assumes that of all the movements of the human body, the handwriting movement can claim to be the expressional phenomenon best adapted for study and exploration. The expressional phenomenon of handwriting was studied by Chinese philosophers more than eight centuries ago and, in more recent times, it has attracted such famous men as Leibniz, Goethe, Gainsborough, Scott, and Browning among many others. G., in short, is self-knowledge through the analysis of handwriting, and in his analysis entitled *Self-Knowledge through Handwriting*, H. J. Jacoby treats the psychology of handwriting in a manner which is novel in the hist. of graphological research and literature, being the first to make the experiment of using illustrative photographs of bodily movements and scenes from life which are analogous to handwriting, instead of theoretical discussion. In the course of teaching G. he has found it easier for the student to understand the expression of a peculiarity in writing if he is able to compare it with that of a familiar movement, gesture, or object in everyday life. This approach to G. assumes that the writing movement follows the same laws as other expressional movements of the human body—gait, a movement of the hand or head. The same is true of the habits and situations in life typical of each person; for every human being, purposely or otherwise, gives a personal touch to the way he behaves in society or expresses himself in his tastes. This characteristic stamp may vary in intensity, but the graphologist assumes that it is always present and that even a complete conscious or unconscious elimination of a personal trait expresses a certain type of personality. The very same habits which find expression in a man's everyday behaviour are correspondingly reflected in his writing. Examples of the handwriting of a man between, say, the ages of twenty-seven and ninety-five show that the basic features of his handwriting remain unchanged and are manifested during all phases of his life. In letters which seem to march like soldiers in their stiff uprightness, the graphologist detects in the writer discipline of will, exactness, or compulsion; in letters irregularly running in all directions, he detects emotional excitability, impulsiveness, or lack of planning; weak writing pressure again may indicate tenderness, conciliatoriness, or lack of energy; strong writing powerful energy, forcefulness, or constraint; angular forms seem to indicate firmness, power of resistance, or rigidity of character; large expansive movements, occupying much space, are deemed to show enthusiasm, display of pathos, or illusionism; and the 'flourishing' writer stresses the unessential, and shows himself lacking a sense of proportion, with a predilection for cheap

effects. It is obvious that these illustrations may be multiplied at will, and that the analogy borne by the writing to character or habits may be more or less remote; but experience, coupled with much graphological knowledge, no doubt conduced to a measure of accuracy in analysing the peculiarities of any given example of handwriting in relation to psychology. See J. Crépieux-Jamin, *L'Écriture et le caractère*, 1888, and *L'Âge et le sexe dans l'écriture*, 1925; L. Klugcrs, *Handschrift und Charakter*, 1916, 1943; R. Saudek, *Experiments with Handwriting*, 1929; M. Pulver, *Symbolik der Handschrift*, 1931, and *Trieb und Verbrechen im Spiegel der Handschrift*, 1934; H. J. Jacoby, *Analysis of Handwriting*, 1939; *Handschrift und Sexualität*, 1932, and *Self-Knowledge through Handwriting*, 1940; and E. Singer, *Graphology for Everyone*, 1919.

Grapsus (Gk. γράπαιος, crab), name of a genus of crustaceans belonging to the family Grapsidae; they are marine crabs and are very numerous on the shores of the Mediterranean. Frequently they are found on exposed rocks, over which they travel at a very rapid pace.

Graptoites, group of fossil remains of extinct marine animals which floated about hanging to the undersides of seaweeds, or in some cases were anchored to the sea bottom. They are usually found in great abundance in the Palaeozoic rocks extending from the Cambrian to the Carboniferous.

Gras, Félix (1844-1901), Provencal writer, b. at Malemort in the dept. of Vaucluse. He made a distinguished appearance as author in 1876 by publishing a work called *La Carbounié*. An epic dealing with the topic of Simon de Montfort and the Albigensians appeared in 1882, and five years later he pub. his celebrated collection of Provencal ballads, *Lou Roumancero Prorençal*. In 1891 he pub. a series of stories dealing with the Hungarian popes under the title *Li Papalino*. His three great novels on the revolutionary period have been trans. into Eng. by C. A. Janvier—*The Reds of the Midi* (1896), *The Terror* (1898), and *The White Terror* (1900).

Graslitz, tn. of Bohemia, situated near the Saxon frontier and 32 m. N.E. of Eger. The manufs. are musical instruments, articles made of mother-of-pearl, and embroidery. Pop. 10,000.

Grasmere, small lake situated in Westmorland. It lies 4 m. N.W. of Ambleside, between Thirlmere and Windermere. It drains through to Windermere by the Itothay. Its length is about a mile. To the N. of the lake the vil. of G. lies. The church of this vil. has been made famous by the description of it given by Wordsworth in *The Excursion*. The poet himself lived much in the immediate vicinity, and lies buried, together with his daughter and sister, in the churchyard there. Pop. 870.

Grässe, Johann Georg Theodor (1814-1885), Ger. historian, b. at Grimma, Saxony. He was the royal librarian and head of the museum of porcelain at Dresden for the greater part of his life.

He retired in 1882. The greatest of his works is *Lehrbuch einer allgemeinen Litterärgeschichte aller bekannten Völker der Welt* (1837-60). He also wrote *Büttcher zur Litteratur und Sage des Mittelalters* (1850) and *Handbuch der alten Numismatik* (1853), and trans. *Gesta Romanorum* (1842).

Grasse, tn. of France in the Alpes-Maritimes dept., about 20 m. S.W. of Nice. It stands well over 1000 ft. above sea level, and is situated in such a way as to be sheltered from the cold winds of the N. and open to the S. The vegetation produced is typical of S. Europe, and many ac. of land are devoted to the cultivation of flowers. The tn. is the centre of the manuf. of perfumes. Pop. 21,200.



A, couch; B, cocksfoot, C, fox; D, false oat.

Grasses (natural order Graminaceæ). These form one of the largest orders in the vegetable kingdom, and some of its members are of great service to man. They are evergreen, ann. or perennial herbs, though bamboo sometimes reach a height of 100 ft. All G. either flower on a spike upon the same model as wheat, or upon a panicle such as oats; some are awned or bearded like barley. Each spikelet, whatever the inflorescence, consists of one to five flowers arranged alternately on a short axis, and beneath the lowest flower there are usually two (or more) empty bracts known as glumes. Each flower is sessile in the axil of a bract termed the outer palea or flowering glume, and there is an inner palea, opposite to and higher than the outer one; these two paleas completely enclose the flower. In some species both stamens, usually one to three in number, and pistil are in the same flower, but more commonly the flowers are unisexual. The stem is generally characterised by swollen or tumid nodes to which the sheathing leaf-bases contribute; the long internodes are hollow, and a membranous ligule is developed at the junction of leaf-base and lamina.

The ovary is one-chambered and one-ovuled, and the fruit or grain, technically known as a caryopsis, is entirely filled by the seed. G. are abundant on land, and a few species inhabit fresh water, but there are no marine forms. In the tropics they acquire a much greater height than in colder regions, but those species of a 'social' habit, constituting turf, are found only in temperate regions. The cereal G., wheat, oats, barley, rye, maize, rice, and various millets, cultivated for the sake of their grain, are the most valuable members of the order to mankind. Among the most esteemed fodder G. are rye grass (*Lolium perenne*); cocksfoot grass; timothy grass (*Pleum pratense*); the sweet-scented vernal grass gives much of its fragrance to new-mown hay; and various species of *Poa* and *Festuca*. The tussack grass (*Dactylis glomerata*) of the Falklands is also much liked by cattle. Sugar is extracted from the stems of the sugar cane, *Saccharum officinarum*, a native of S.E. Asia, but now cultivated throughout the tropics; and to a smaller extent from those of the guinea corn, *Sorghum saccharatum*. Other useful products of the family are bamboo; a valuable material for paper making, obtained from esparto grass (*Macrochloa tenacissima*); aromatic 'grass-oils,' such as verbena, citronella, and geranium or ginger grass, much used in perfumery. See also LAWN.

Grassholm, is. 18 m. off the coast of Pembrokeshire, S. Wales. The rocky ground is covered in summer with Yorkshire fog (*Lolium Parvum*) and lichen, and seals abound in the surrounding waters. G. is the property of the National Society for the Protection of Birds, and is the home of several rare species of birds. The is. is especially famous as a breeding place of the gannet or solan goose, of which about 7000 pairs are said to assemble there yearly.

Grasshoppers, insects belonging to the families Locustidae and Acridiidae, which have very long hind legs with strong thighs, enabling them to jump great distances. The Locustidae or green G. have very long antennae, four-jointed tarsi or feet, a long ovipositor, and the stridulatory organ in the wings; while the Acridiidae (to which family the 'locusts,' the true G., belong) have short antennae, no ovipositor, feet with three joints, and the stridulatory organ in between the hind leg and the wing. These insects inhabit woods, thickets, and fields, and feed on vegetables and plants, but some eat flies and caterpillars as well. They generally fly about in the twilight, and being of a green or brown colour can easily hide themselves among the foliage. They lay their eggs either in the earth or in a dry stem; these hatch in spring and produce the young G., which moult six times before they become full grown. The 'chirp' is produced by the friction of the hind legs against portions of the wings or wing-covers in the Acridiidae, but in the Locustidae by scraping one wing against the other. The common Brit. type is the *Locusta migratoria*, which has a body about an inch long, but the *Decticus ver-*

rucivorus (so called because the Swedish peasants use it to cure warts) is also found.

Grass Lands. Agric. areas may be roughly divided under three headings: permanent pasture, rough grazing land, and arable lands. In England and Wales 9,917,000 ac. are devoted to pasture, 4,155,000 ac. to rough grazing, and about 14,369,000 ac. are arable lands. In Ireland out of a total area of 17,000,000 ac., 11,565,000 are devoted to crops and pasture, while 2,000,000 ac. are mt. grazing land. In Scotland half the complete area of the land, 10,956,000 ac., consists of rough grazing land suitable for the most part for sheep-rearing. Arable land—that is, land suitable for raising crops and ploughing—are also grass lands at frequent intervals. These are determined by the method adopted for the rotation of crops. In England and Wales one year in each series of four, or two years in each series of five, would be devoted to grass, but in Ireland the method is frequently five years crops and roots, followed by three years grass.

Grassmann, Hermann Gunther (1809-77), mathematician and Sanskrit scholar, b. at Stettin. Was prof. of mathematics at the Gymnasium at Stettin. In 1841 he pub. his mathematical work, *Die Wissenschaft der extensiven Grossen oder die Ausdehnungslehre*, which did not at first meet with a favourable reception. At the age of fifty-three he began his study of Sanskrit and made a great reputation. He pub. on this subject *Wörterbuch zum Rig-Veda* (1873) and a trans. of *Rig-Veda* (1873). Among his other scientific works are *New Theory of Electro-dynamics*; *Theory of the Mixture of Colours*; and treatises on arithmetic and trigonometry. He enunciated, in 1863, the linguistic law which bears his name.

Grass-moth, small moth, allied to the clothes-moth, which inhabits pastures. It is generally brown in colour, and long and narrow in shape, with a pointed head.

Grass of Parnassus, or *Parnassia palustris*, species of Saxifragaceæ, which is found in damp places of Britain. The flower consists of five sepals, petals, and stamens, and there are also five staminodes; the petals are white, and the plant is of graceful appearance. It is fabled to have appeared first on Mt. Parnassus, hence its name.

Grass Oil, name under which several volatile oils derived from widely different plants are grouped. Ginger G. O., derived from the Indian plant *Andropogon nardus*, and geranium oil, from *Pelargonium radula*, are very similar in properties, and are used for adulterating oil of roses. Turkish G. O. and lemon G. O. or citronella oil are both obtained from India; the latter has an odour resembling citron, and is largely used for scenting soap.

Grass Snake (*Tropidonotus naevius*), ringed snake found in England and in all the countries of Europe except Scotland and Ireland. It is of a brownish colour and differs from the common viper or adder in that it has not the zigzag black line down its back. There are two yellow

or white spots behind its head which make it easy to recognise. The usual length is 3 ft. or a little over; it rarely reaches 4 ft. The snake hisses and strikes out with its head when attacked, but does not bite. It inhabits moist places, and feeds chiefly on frogs, toads, and fishes. It lays its eggs (which resemble a dove's in size and shape) in mould or under damp leaves. These vary in number and are glued together.

Grass-tree and **Black-boy**, names given to a liliaceous plant found in Australia, and called technically *Xanthorrhoea hastilis*.

Grass Valley, tn. in Nevada co., California, U.S.A., 55 m. N.E. of Sacramento. It is served by the Nevada Co. narrow gauge railway, which connects with the S. Pacific. It is noted for its gold-mines and is a growing health resort. Pop. 5,700.

Gratian, or **Gratianus**, was b. at Chiùsi in Tuscany at the beginning of the twelfth century. The greater part of his life was spent in the monastery at Bologna, but he also taught in the univ. He is famous as the founder of the science of canon law and for his book, *Concordia discordantium canonum* or *Decretum Gratiani*.

Gratianopolis, see **GRIEBL**.

Gratianus, **Augustus** (A.D. 359–83), Rom. emperor, son of Valentinian and Severa, b. at Sirmium in Pannonia. In 366 he was made consul, and the following year received the title of Augustus. On the death of his father in 375 the troops proclaimed Valentinian II., his half-brother, emperor. G. divided the provs., but the real authority remained in his hands. In 378 he defeated the Lentienses at Argentaria, and in 379, with the help of Theodosius, drove the barbarians out of the Balkans. The first years of his rule were marked by energy and success, but later in life he became indolent and pleasure seeking. This aroused the contempt of the Rom. troops, and they elected Maximus, who was then in Britain, as emperor. He at once crossed to Gaul and defeated G. near Paris. G. fled to Italy, but was overtaken near Lyons and killed.

Grattan, **Henry** (1746–1820), Irish statesman and the greatest of Irish orators, b. in Dublin. He was educated at Trinity College, Dublin, and gave himself up to the study of the classics, especially the great orators of antiquity. At the age of twenty-one he entered the Middle Temple, London, but took little interest in his legal studies, availing himself of every opportunity to listen to debates in the House of Commons. In 1772 he was called to the Irish Bar, and in 1775 entered the Irish Parliament as member for the bar. of Charlemont. The nation was then suffering from the loss of markets that followed the war with America, and from the restrictions upon trade which dated back to William III.; G. championed the cause of Irish independence, and in 1770 got a total repeal of all the restriction Acts. His next step was to move a declaration for the independence of the Irish Parliament; it was granted, and

his countrymen voted him £50,000. This independence, however, was only nominal without reform, and for this G. pressed. He was also in favour of Catholic emancipation, and in 1785 supported Pitt's commercial propositions for establishing free trade between Great Britain and Ireland. In 1792 he succeeded in carrying an Act conferring the franchise on the Rom. Catholics, and in 1794 introduced a Reform Bill; but his mild measures promoted more extreme opinions, the country drifted into rebellion, and G. retired from Parliament in 1797. He returned to take his seat for Wicklow, however, in the last session of the Irish Parliament and fought the Union Bill. He was member for Malton, Yorkshire, in 1805 and for Dublin in 1806. His last years were devoted to the cause of Catholic emancipation, but, though supported by Canning and other statesmen, did not live to see his triumph. He was buried in Westminster Abbey beside Fox. G. was famous for his remarkable eloquence and incorruptible patriotism. See W. Lecky, *The Leaders of Public Opinion in Ireland*, 1881, and lives by H. Gratian (the younger), 1830–46, R. Dunlop, 1889, and A. Zimmerm., 1902.

Gratz, see **GROTSK**.

Grätz, in Austria, see **GRATZ**.

Gräubünden, see **GRISONS**.

Graudenz, or **Grudzianz** (Polish, Grudziatz), tn. in the prov. of Pomerze, Poland, situated on the r. h. of the Vistula, 18 m. S.S.W. of Marienwerder. It has communication by boat with Danzig and many marts. "The fortress was built by Frederick the Great in 1772–76, and was a little to the N. of G. The remains were later used as barracks and prison. It was seized by Prussia in 1772, but restored to Poland. Captured from the Gers. by the Russians in Jan. 1915. Pop. 54,000.

Graun, **Karl Heinrich** (1704–59). Ger. musical composer, b. at Wahrsbrück in Saxony. He studied under Johann Schmidt, and at an early age composed a number of sacred cantatas. He had a beautiful voice, and when a boy was in the choir at Dresden; and later, when his voice changed to a tenor, mad. his débüt at the opera of Brunswick (1725). He re-wrote much of the music he had to sing and was commissioned to write an opera for the next season. This piece, *Polydorus*, made him famous throughout Germany, and he was engaged by Frederick the Great for his private chapel at Rheinsberg. He composed twenty-eight operas, of which *Merope* is the best, as well as cantatas and pieces for the church service; his oratorio, *The Death of Jesus*, is perhaps his greatest achievement. See K. Mennicke, *Hasse und die Brüder Graun als Sinfoniker*, 1906.

Gravel, collection of small stones formed by the action of water upon rock, which is found in rivers and on the seashore. It varies much in character and appearance; when the fragments are small the deposit is sand, when large it is called shingle. It consists of pieces from all kinds of rock, but pebbles of quartz and quartzite are most common. When first deposited the

G. is loose, but after a time it forms a hard rock known as 'puddingstone.' There are various kinds, the best being the 'Kensington,' a pit G. consisting of large quantities of oxide of iron which makes it binding (a quality essential for a good G.), and gives it a rich colour. Other kinds are the 'Dorset Pea,' composed of flinty pebbles about the size of a pea; the 'Lymington,' a flint G. which comes from Hampshire; the 'Sussex Pea,' and 'Sussex Bean,' and the 'Shell G.,' found on the coasts of the Channel Is.

Gravelines, port and tn. of France, in the dept. of Nord and the arron. of Dunkirk. It is situated about 11½ m. S.W. of Dunkirk and 48 m. N.W. of Lille. The harbour is 75 ac. in extent, with a depth of from 16 to 18 ft. The cod and herring fisheries are important, and an export trade with England is carried on in fruit, vegetables, eggs, and fish. Other industries are paper, sugar, fish curing, and vegetable preserving. Pop. 5400.

Gravelotte, tn. in Alsace-Lorraine, France, about 6½ m. W. of Metz. A famous battle was fought in the neighbourhood of this tn. in 1870, in the Franco-Ger. war, resulting in the defeat of the Fr. under Marshal Bazaine. Pop. about 360.

Graves, Alfred Perceval (1846-1931), Irish author and expert in folk-song, b. in Dublin; son of a bishop of Limerick (1812-99). Educated at Trinity College; a civil servant and, from 1876 to 1910, inspector of schools. Famous as author of *Father O'Flynn* (1872) and *To Return to All That* (1930). Wrote a play, *The Absentee* (1908).

Graves, Clotilda Inez Mary (1863-1933), Brit. journalist, novelist, and playwright, b. at Barracks, Buttevant, co. Cork; third daughter of Maj. W. H. G. Among her plays are the Drury Lane pantomime *Puss in Boots* (1888) and *The Bond of Union* (1906). Her best known novel is *The Dop Doctor* (1910), written under the pseudonym of Richard Dehan. Other works: *Between Two Thieves* (1912); *The Headquarter Recruit* (1913); *The Man of Iron* (1914); *Earth to Earth* (1916); *A Sailor's Home* (1919); *The Just Reward* (1922); *The Lottery of the Market Place* (1928); and *Dead Pearls* (1932).

Graves, Richard (1715-1804), Eng. poet and nov.-list, b. in Gloucestershire. Some of his poems appeared in the collections of Dodsley and Pearce. He attained greater popularity, however, by his novels, all of which are now forgotten except the *Spiritual Quarto*.

Graves, Robert Ranke (b. 1895), Brit. poet, novelist, and critic, son of Alfred Perceval G., a well-known figure in the Irish literary movement. He served with the Welsh Fusiliers on the W. Front in the First World War, when he became known in Engla. as one of three friends and poets, the others being Siegfried Sassoon and Robert Nichols. He was appointed prof. of Eng. literature, Egyptian Univ., in 1926. His poems have been classified into war, amateur, metaphysical, and poems of unrest; they are generally simple in expression. In those on nursery

rhymes and fairy-tales, the old and new are happily interwoven. The war poems present a mood of satiric desolation. Traditional themes, in poems like *In the Wilderness* and *The Avengers*, are invested with a rare pathos and lucidity. It is because his poetry seems to tend 'towards no certain end' that it merits consideration. 'Chaos may in the end be too strong for him, yet every poem he writes is worth reading, since he creates confidence that he has the power to organise, out of his very interesting chaos, a universe of corresponding interest' (A. C. Ward). His poetry includes *Over the Brazier* (1916); *Fairies and Fusiliers* (1917); *Country Sentiment* (1920); *The Pier Glass* (1921); *The Feather Bed* (1923); and *Welchman's Hose* (1925). *Collected Poems, 1914-27*, appeared in 1927. *Collected Poems* in 1938, and *Poems, 1938-45*, in 1946. Other works include *Goodbye to All That* (1929); *I, Claudius* (1934); *Claudius the God* (1934); *Count Belisarius* (1938); *Sergeant Lamb of the Ninth* (1940); *The Story of Marie Powell, Wife to Mr. Milton* (1943); *The Power of the Dog* (1945); and *King Jesus* (1947). His prose work is mainly critical. A theorist as well as poet, his treatise *On English Poetry* (1922) is a sound piece of criticism, avoiding the extremes of traditionalism and emancipation.

Graves, Thomas, first Baron G. (c. 1725-1802), Brit. admiral who served in many famous expeditions, among which may be mentioned the engagement in Chesapeake Bay in 1781 and the operations against the Fr. in Hudson Bay. He was second in command to Nelson at Copenhagen.

Graves, Sir Thomas (c. 1747-1814), admiral, the first cousin once removed of Adm. Thomas Lord G. In 1773 he went on a voyage of discovery in the Arctic Seas with Lord Mulgrave. He was in command of the *Bedford* during the action in Chesapeake Bay and was present in the engagement at St. Kitts. In 1783 he fought the Fr. frigate *Sibylle*, and, later, was at the battle of Copenhagen.

Gravesend, municipal bor., gateway of the port of London, and mkt. tn. in Kent, extending 2 m. along the r. b. of the R. Thames, 22 m. E. of London. One member is returned to Parliament, the parl. bor. including Northfleet, Swanscombe and the rural dist. of Strood. It is mentioned in Domesday Book under the name of Gravesham and was among the bishop of Bayeux's lands. The municipal bor. was incorporated by charter on July 22, 1562, superseded June 5, 1568, and renewed and extended on March 14, 1632. Queen Elizabeth estab. G. as the point of welcome by the corporation of London for eminent foreign visitors. It was the point of departure for E. Indiamen and for other sailing ships, and was formerly defended by two forts on the Kent side of the riv. and by Tilbury fort on the Essex side. It was formerly a boundary for the coal dues of the port of London. Princess Porahontas d. at G. in 1617 and is reputed to have been buried at St. George's Church. Gen. Gordon of Khartoum resided in G. from 1865 to 1871. His home was destroyed by enemy action

in Nov 1944. There are two piers—the Town Pier, built 1834 and the Royal Terrace Pier, built 1845. It is a headquarters of Trinity House (London), pilot station, and has a custom house. The corporation owns a promenade and gardens along the riverside. Trade is principally concerned with paper manuf., cement works, electrical supplies, shrimp-ing, and market gardening. Pop 41,200 (estimated).

Graves, Soldiers'. The enormous casualties of the First World War brought into prominence the question of burial and of

tinued up to the outbreak of the Second World War (1939), but in the year 1938-39 the number was much less than in previous years. Visits to the cemeteries have been organised by voluntary associations, particularly on the occasion of the unveiling of a general memorial. Much detail may be obtained from the annual reports of the commission, whose permanent headquarters are now situated at Wooburn Green, near High Wycombe, Buckinghamshire. By fostering the remembrance in common of the dead of the First World War the com-



Imperial War Graves Commission

THE BRITISH MILITARY CEMETERY AT RONV, ITALY

This cemetery contains 4,0 British Commonwealth graves of the Second World War.

the upkeep of the G. of the dead. In the case of the Brit. Empire it was agreed at the Imperial Conference (*q.v.*) of 1919 that such G. should be maintained permanently. To deal with the matter the Imperial War G. Commission was constituted, which consists of the secretaries of state for war (chairman) and the colonies, the minister of works, the high commissioners of Canada, Australia, New Zealand, South Africa, India and Pakistan and various other persons. The duke of Gloucester is president and Adm. Sir Martin Dunbar Nasmyth V.C. K.B., vice-chairman. In every battlefield of the First World War proper cemeteries have been made and headstones and other means of identification provided. Areas have been searched for the missing, their identity estab., and proper burial carried out. The discovery of Brit. bodies by local inhab. on the former battlefields con-

mission were persuaded that they might make a practical as well as a sentimental and emotional contribution to the maintenance of peace. But while the commission were still finding on the battlefields of the First World War, and giving burial to the remains of men who had given their lives 'to end war' they were called upon to prepare for a new harvest of death and to protect the very memorials visibly recording the sacrifice of the past from the effects of a fresh outbreak of violence. In 1938 following a visit by members of the 'Anglo-Ger. Br. mixed committee' to England, an informal agreement was reached under which Great Britain and Germany reciprocally assured the care of enemy G. during the subsequent hostilities. By agreement with the participating govs. the powers bestowed on the commission by the original charter and supplemental charters have been

extended to cover the commemoration of the dead of the Second World War. So swift was the allied advance in N. France in 1944 that the tide of battle swept past the Brit. war cemeteries and memorials of the First World War and left them for the most part unscathed. As France and Belgium were liberated, it was found that the cemeteries had, on the whole, been respected by friend and foe alike. At Cologne the Brit. cemetery was found to be in good condition (1945). Of the great memorials, the Menin Gate suffered rather more damage than had been expected, though largely on the surface, but name panels were found damaged and the bronze gates had been removed. Much remains to be done to bring the cemeteries to their former standard; but fortunately the commission is in a strong financial position, with an endowment fund of nearly £6,000,000. Cemeteries and memorials of the First World War in many other parts of the world have been maintained at a high standard. For the commemoration of the dead of the commonwealth and empire in the Second World War arrangements were made for taking over recorded G. as soon as conditions allowed. First cemeteries in N. Africa to be constructed are those at Sollum and Acroma, designed by Sir Hubert Worthington, first of the commission's prin. architects appointed for Second World War cemeteries. As in other foreign countries, the Egyptian Gov. expressed willingness to provide the requisite land for the new cemeteries considering that Brit. troops had d. not only for the mother country but also for Egypt. A local chieftain in Eritrea gave the site of the Brit. cemetery at Keren. Numerous sites and layouts S. of Homo were prepared for Brit. G. in Italy. Under the guidance of Mr. Edward Maufe, whom the commission appointed its prin. architect in the United Kingdom, the R.A.F. regional cemeteries, and many of the larger service plots in municipal cemeteries, have developed in such a way as may render some of them places of pilgrimage no less beautiful in their horticultural and architectural features than the cemeteries of the last war overseas. Wooden crosses and other markers, later to be replaced by permanent headstones, are wherever possible set in narrow flower borders between stretches of level turf. At Brookwood are special plots for Fr., Belgian, Czechoslovak, and Polish dead, and similarly for the Canadian dead from the Dieppe raid. Out of a total of about 350,000 graves scattered throughout the world, by autumn 1948 some 212,000 G. had been taken over from the army by the War G. Commission. Approximately 40,000 of these are located in Italy. They are divided among forty-two cemeteries, stretching from Sicily to the foot-hills of the Alps. Their size varies: the large necropolis at Cassino contains over 4000 G.; others, like Padua, a few hundred. The pilgrim will naturally see the close connection between the progress of allied military operations in 1943-44 and the cemetery sites. They lie in most cases

near or on the spot where many actions for the liberation of Italy were fought. Sicily has three concentrations—Agira, Catania, and Syracuse. The cemetery at Cassino is set in a tremendous natural amphitheatre. Of all these moving burial areas in Italy none is more serene than that at Assisi, near to the churches and monastery rich in memories of the saint who perhaps more than any other is dear to the Eng. race. The commission have made it their particular concern to blend the layout of the cemeteries with the natural beauty and architectural character of their environment. The general treatment of the sites is uniform, and on the lines adopted for the G. of the First World War. The effect aimed at is that of an Eng. garden rather than that of the local *campi santi* and headstones take the place of crosses. The central features are again the great Cross of Sacrifice designed by Sir Reginald Blomfield and the Stone of Remembrance, by Sir Edwin Lutyens, serving to underline the fact that here is ground "that is for ever England." Among cemeteries in the Pacific area the sites of three are of outstanding interest and beauty: Bitia Paka, 32 m. from Rabaul, with 2800 burials; Amboin, overlooking Amboina Bay, with 2000 burials; and Makassar, with 600 burials, mostly United Kingdom sailors and marines who were prisoners of war in Celebes.

Graville St. Honorine, tn. in France in the dept. Seine-Inferiore, about midway between Havre and Harfleur. It has copper, zinc, and lead mines. Pop. about 13,000.

Gravina, Giovanni Vincenzo (1661-1718), It. jurist, b. at Roggiano, near Cosenza in Calabria. In 1699 he occupied the chair of civil law, in the college of La Sapienza, and in 1703 that of canon law. He wrote *Origines juris civilis*, which estab. his reputation as a jurist; *De Romano imperio*; *Della ragion poetica*; and sev. tragedies.

Gravina, tn. of S. Italy in the prov. of Bari, about 32 m. from the tn. of Bari. It is surrounded with walls and towers, and a castle of the Emperor Frederick II. rises above the tn. Pop. 22,500.

Graving Docks, *see under Dock and HARBOUR.*

Gravitation, term used in physical science for the mutual attraction between masses of matter. The full statement of Newton's law of G. is *Every particle of matter in the universe attracts every other particle with a force whose direction is that of the line joining the two, and whose magnitude is directly as the product of the masses and inversely as the square of their distance from each other.* In order to marshal the evidence for this great generalisation it is convenient to consider it under the following heads: (a) The direction of the force between the particles; (b) the law of inverse square of distance; (c) the universality of the law of inverse squares; (d) the proportionality of the force of attraction to the product of the attracting masses. Newton based his investigation into the law of G. on the three laws deduced by Kepler from the astronomical observa-

tions of Tycho Brahe. Kepler's laws are purely kinematical. They completely describe the motions of planets, but they say nothing about the forces by which these motions are maintained. Their dynamical interpretation was discovered by Newton. *Law 1:* Each planet describes an elliptical orbit. The sun occupies one focus of the ellipse. *Law 2:* The radius vector of each planet sweeps out equal areas in equal times. *Law 3:* The square of the periodic time (in an elliptical orbit) is proportional to the cube of the major axis of the ellipse.

(a) As an immediate consequence of Law 2, Newton showed that the direction of the attraction of the sun for a planet must be that of the line joining them. For twice the area described by the radius vector of a planet in one second is numerically equal to the moment of its velocity about the centre of the sun. Hence, as the moment of the velocity of the planet is constant, the moment of each successive increase of velocity must be zero. Hence these increments in velocity (*i.e.* the accelerations) must be directed towards the sun. But the direction of the acceleration must coincide with the direction of the force which causes the acceleration. Therefore the force of attraction must be directed towards the sun.

(b) The acceleration of the planet can readily be calculated to be $4\pi^2 \frac{a^3}{T^2} \frac{1}{r^2}$, where a is the semi-major axis of its elliptical path, T the periodic time, r the distance of the planet from the sun. Hence the acceleration of the planet is inversely proportional to the square of its distance from the sun. Therefore the force of attraction due to the sun varies inversely as the square of the distance.

(c) Kepler's third law states that $\frac{T^2}{a^3}$ is the same for all planets. Hence it is the same G , diminishing as the square of the distance increases, which acts on each one of the planets. In other words, the force of attraction due to the sun does not pay any attention to the quality of matter. The inverse square law is universally true for every kind of matter.

(d) The expression $4\pi^2 \frac{a^3}{T^2} \frac{1}{r^2}$ shows that the acceleration of a planet towards the sun depends only on its distance r from the sun, since a^3 is constant for all planets. Hence the force acting on a planet due to the sun's attraction is proportional to the mass of the planet. Since action and reaction are equal, each planet reacts on the sun with a force equal and opposite to that exerted by the sun or the planet. Hence each planet acts with a force proportional to its own mass and inversely as the square of the distance away. We must therefore conclude that the sun, which is a planet of great magnitude, also acts with a force proportional to its own mass. Hence the force acting on a planet due to the sun is (1) proportional to the mass of the planet; (2) proportional to the

mass of the sun, *i.e.* the force is proportional to the product of the attracting masses. In the above discussion the dimensions of the sun and planets have been considered as inappreciable compared with their distances apart. Measurement shows that they are approximately spherical; is, then, the attraction exerted due to the attracting body as a whole, or is it due to its separate particles each acting independently? Newton attacked the question by assuming the law of G . for the separate particles of a body, and thence finding the law of attraction for the body as a whole. He thus arrived at two exceedingly striking theorems: (1) A spherical shell of uniform matter exercises no attraction on a particle inside it. (2) A spherical shell or uniform matter attracts an external particle as if its whole mass were concentrated at the centre.

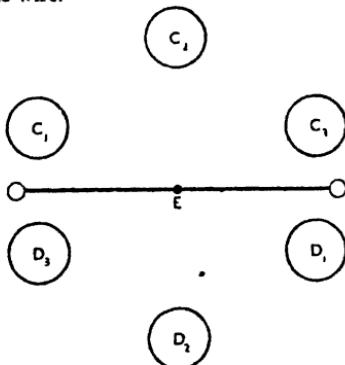
An obvious corollary from the second theorem is that a sphere made up of uniform concentric shells attracts, and is therefore attracted by all external bodies, as if its whole mass were concentrated at its centre. Since the planets behave as if their masses were concentrated at their centres, and since their departures from this behaviour can all be accounted for by their want of sphericity, there is a very strong presumption that the attraction is the resultant of all the attractions, each particle of mass m of one body exercising on a particle of mass n of another body an attractive force of $\frac{Gm \times n}{d^2}$, where d is the distance between the two particles, and G is a constant—the constant of G . The law of G is unique among the laws of nature in the fact that it is unaffected by any condition or cause whatsoever. The force of attraction between two electrified charges is modified by the medium intervening between them, and also by their relative or absolute motions. But no conditions to which matter has ever been subjected have been found to affect its G in the slightest degree.

Determination of the mass of the earth and the mass of the sun.—Astronomical observations enable us to compare the masses of the various members of the solar systems. For example, the acceleration of the earth towards the sun is about 0.6 cm. per sec. per sec.; the distance between the two is 15×10^{12} cms. The acceleration of the moon towards the earth is about 0.27 cm. per sec. per sec. and the distance between them is 4×10^{10} cms. If S is the mass of the sun, E the mass of the earth, M the mass of the moon, then $0.6 = \frac{GS}{(15 \times 10^{12})^2}$ and $0.27 = \frac{GE}{(4 \times 10^{10})^2}$ therefore the ratio $\frac{S}{E} = 300,000$ approximately. To determine S and E in terms of the terrestrial standards of mass, the kilogramme and the pound, recourse must be had to experiments with terrestrial masses. A body of mass m suspended at the earth's surface is attracted by a force $G \times E \times \frac{m}{R^2}$, where E is the mass of the

earth. But if ρ is the acceleration of a body falling freely under the influence of the gravitational force of the earth, the value of this force is also expressed by mg . Then $mg = \frac{G \times E \times m}{R^2}$ or $E = \frac{\rho R^2}{G}$. To determine G the force F between two artificially prepared masses M_1 and M_2 at a distance apart d is measured, and since $F = \frac{GM_1 \times M_2}{d^2}$ we get at once $G = \frac{Fd^2}{M_1 M_2}$.

$$\therefore E = \frac{\rho \times R^2 \times M_1 \times M_2}{Fd^2}$$

Cavendish's experiment.—An experiment for determining the force of attraction between two artificial masses was first planned by the Rev. John Mitchell who did not live to begin work on the apparatus which he had designed and completed. After Mitchell's death the apparatus came into the hands of Henry Cavendish, who largely reconstructed it but adopted Mitchell's original plan. The attracted masses consisted of two small balls, A and B, an inch or two in diameter, connected by a stiff wooden beam suspended at its middle point E by a long fine wire.



The whole of this part of the apparatus was enclosed in a case, carefully coated with tinfoil to secure, as far as possible, a uniform temp. within the case. Irregular distribution of temp. would have resulted in convection currents of air which would have had a serious disturbing effect on the suspended system. To the beam was attached a small mirror with its plane vertical. A small glazed window in the case allowed any motion of the mirror to be observed by the consequent deviations of a ray of light reflected from it. The attracting masses consisted of two equal, massive, lead spheres, so mounted that they could be made to move from the positions $C_1 D_1$ to the positions $C_2 D_2$ or $C_3 D_3$. Cavendish found that the suspended system was never at rest. The equilibrium position was determined by the method usually employed when weighing with a delicate balance. When the large masses were placed at $C_2 D_2$, the oscillations were

practically due to the torsion of the wire. If T is the period of vibration for this position of C and D , and I the moment of inertia of the suspended system, then $\mu = \frac{4\pi^2 I}{T^2}$, where μ is the couple required to

twist the lower end of the wire through unit torsion relatively to the top end. The angle θ through which the beam was deflected when the attracting masses were moved from the positions $C_1 D_1$ to the positions $C_2 D_2$ was measured. Then $\mu\theta = 2G \times M \times m \times l$, where l is the length of the

beam and d the distance between the centres of the attracting and attracted masses. Whence $G = \frac{\mu d^2}{2M \times m} = \frac{2\pi^2 I \cdot \theta \cdot d^2}{T^2 M \cdot m}$. The experiment has been repeated by Reich, Bailey, Cornu, Boys, and Braun. Cavendish obtained for the value of G 6.6×10^{-8} dynes, Reich 6.613×10^{-8} , Bailey 6.685×10^{-8} , Boys 6.6576×10^{-8} , Braun 6.65786×10^{-8} . The remarkable agreement between the results of these experiments, which were performed at different times and at different places on the earth's surface, provides a powerful confirmation of the truth of the law of G.

Cause of Gravitation.—The cause of G. remains undiscovered. Newton, in his celebrated *Letters to Bentley*, says: "You sometimes speak of gravity as an essential and inherent to matter. Pray do not ascribe that notion to me; for the cause of gravity is what I do not pretend to know, and therefore would take more time to consider it. It is inconceivable that inanimate brute matter should, without the mediation of something else which is not material, operate on and affect other matter without mutual contact, as it must do if gravitation in the sense of Epicurus be essential and inherent in it. . . . That gravity should be innate, inherent, and essential to matter so that one body may act upon another at a distance through a vacuum, without the mediation of anything else, by and through which their action and force may be conveyed from one to the other, is to me so great an absurdity, that I believe no man who has in philosophical matters a competent faculty of thinking, can ever fall into it. Gravity must be caused by an agent constantly acting according to certain laws; but whether this agent be material or immaterial, I have left to the consideration of my readers."

Attempts have been made to account for G. by means of stress in the intervening medium on the plan adopted for electric and magnetic forces. Calculation shows that the stress which must be supposed to exist in the invisible medium must be 3000 times as great as that which the strongest steel could support. Le Sage's theory that the G. of bodies towards each other is caused by the impacts of streams of atoms flying through space leads to the inverse square law of attraction, but it demands that the rate at which the energy of the bombarding atoms is spent in order to maintain the gravitating property of a single pound is at least millions of millions

of foot-pounds per second. In fact, all these theories which have been advanced to account for G. imply the existence of stresses or the presence of stores of energy absolutely gigantic in comparison with anything hitherto observed or even suspected to exist in the universe. These difficulties are resolved by the general theory of relativity, in which the notion of gravitational attraction is itself abandoned (see RELATIVITY).

Gravity. Centre of, see CENTRE OF GRAVITY.

Gravity, Specific, see SPECIFIC GRAVITY. Gravosa, fortified harbour of Dubrovnik in the state of Yugoslavia. It is a seaport and fishing tn. Pop. 1500.

Gray, Asa (1810-88), Amer. botanist, b. in Paris, New York. In 1812 he was appointed Fisher prof. of natural hist. at Harvard Univ., and devoted himself to the estab. of a herbarium and a library there. His *Manual of the Botany of the Northern United States* (1862) is his most important work, but he also pub. a *Botanical Text-book* (1839); the *Botany of Japan in Relation to North America* (1849), which is remarkable for its originality and far-reaching results; *How Plants Behave* (1872); *Synoptical Flora* (1886); and *How Plants Grow* (1891).

Gray, David (1838-61), Scottish poet, b. at Merkland, near Glasgow. He was educated at Glasgow Univ. for the church, but at an early age began to write verses. He became intimate with the poet Robert Buchanan, with whom he went to London in 1860. There he became acquainted with Lord Houghton, who gave him some literary work and endeavoured to get his poem *The Laggie* pub. in *The Cornhill Magazine* (1862). This poem, a reminiscence of the scenes and events of his childhood, is his chief work, but he also wrote a series of sonnets, *In the Shadows*, which have a beauty all their own. See R. Buchanan, *David Gray and other Essays*, 1868, and B. Ifor Evans, *English Poetry in the Later Nineteenth Century*, 1933.

Gray, Elisha (1835-1901), Amer. inventor, b. at Barnesville, Ohio. He studied for a time at Oberlin College, but afterwards took up the subject of telegraphy, and in 1867 patented a telegraphic switch. He also experimented with the telephone, which he claimed to have invented, his application for a patent being received only a few hours after Alexander Bell's. He was engaged for some time in the manuf. of telegraphic apparatus, and was the electrical expert of the W. Electric Company of Chicago. Among his inventions are the multiplex telegraph, by which eight messages can be sent at a time, and the telautograph, by which handwriting can be transmitted.

Gray, John Edward (1800-75), Eng. naturalist, b. at Wal-all. In 1840 he was appointed keeper of the Zoological collections and made them the most complete in the world. He wrote many books, the most important being his catalogues of the Brit. Museum collections.

Gray, Stephen (c. 1670-1736), Eng. physicist, was a Charterhouse pensioner, and became a fellow of the Royal Society

in 1732. His most important contribution was the div. of substances into electrics and non-electrics, and the discovery of methods of their mutual transformation.

Gray, Thomas (1716-71), Eng. poet, son of a scrivener, who was of so cruel and violent a temper that his wife had to separate from him; b. in London, and educated at Eton and at Peterhouse, Cambridge. To his mother and sister, who carried on a business, he was indebted for his liberal education at Eton (where he became a friend of Horace Walpole) and Cambridge. Of a studious and reserved nature, he formed few intimate friendships, but these were lasting ones. The story of his life is simple and colourless, the outstanding event in it being his tour on the Continent with Horace Walpole, 1739-41. Their unfortunate quarrel, late in this tour, which was not healed for three years, was the only break in a life-long attachment. Returning to England, G. found his father dying and his mother only moderately provided for. After residing with her for a while at Stoke Poges he went back to Cambridge, where, except for brief intervals, he spent the rest of his life. There he became a fellow of Peterhouse and, later, transferred himself to Pembroke College. He had always a tendency to melancholy, the best cure for which would have been plenty of exercise and cheerful company; of the former, however, he took little, and the latter he was too reserved to enjoy freely. Yet he was naturally very humorous, and his letters, charming in their mixture of fun, sincere friendliness, and wise criticisms of men and books, are worthy to stand with those of Lamb. His learning was immense, not only in the classics, but also in art and natural science. He holds an honourable place in Eng. literature, though his works are small in quantity, and in quality do not attain the highest rank, even the immortal *Elegy* owing its fame to exquisite expression and natural pathos rather than to greatness or originality of thought. But if this, the Odes, and the trans. from the Norse be compared with anything written by his immediate predecessors (except Thomson), it will be seen that G. was a pioneer, a true poet in a prosaic age, and the forerunner of Goldsmith and Cowper in breaking away from the monotonous artificiality of early eighteenth-century verse. No wonder that Johnson, who condemned *Lucidas*, failed to appreciate *The Progress of Poetry* and *The Bard*, but it is quaint to find the author of *Rasselas* complaining of the 'cumbrous splendours' of G. and elsewhere of his 'dullness.' Other contemporaries called him obscure. G. was one of the first to celebrate the glories of mt. scenery. While other writers were still shuddering at 'horrid precipices' and 'frightful solitude' he was enthusiastic in his admiration of the Alps, and later of the Grampian and 'Cumbrian peaks. See E. Gosse, *Gray's Works*, 1884, and life, 1889; *Poems and Letters* (Everyman's Library); and Matthew Arnold's fine essay on G.

Gray, com. of France, on the l. b. of the Saône in the dept. of Haute-Saône. It has

a fine quay on the riverside and carries on a busy trade. Pop. 5800.

Grayling, fresh-water fish of the salmon family, having a long many-rayed fin. It is found in the N. of Europe, Asia, and N. America. The Brit. G. generally inhabits rvs. with rocky or gravelly bottom, and is in best condition when trout are out of season.

Grayling Butterfly (*Hipparchia semele*), butterfly widely distributed over the Brit. Isles. It has dark brown wings with two black eye-spots on each of the fore-wings and one black eye-spot centred with white on the hind wings. It is found on heaths and in dry stony places, especially on chalk and in clearings in woods.

Gray's Inn, see INNS OF COURT.

Grayson, David, see BAKER, RAY STAN-NARD.

Gray's Thurrock, par. and tn. of Essex, England, situated on the Thames, 3 m. N.W. of Tilbury and 12 m. S.E. of Romford. There are two training ships and a trade in cement, lime, and bricks. A portion of Roman tessellated pavement and other antiquities have been found here. Pop. 60,000.

Graz (Grätz until 1843), tn. of Austria, cap. of Styria, on the Mur, at the head of the valley's expansion round the foot of the hill, Schlossberg. There is a railway communication both N. and S. across the Mur's valley, and E. by the valley of the Raab. It is a bishop's see. Buildings of interest are the univ. (1586, new buildings 1890-95); fifteenth-century Gothic cathedral (with fine altar-pieces and glass-paintings); mausoleum of Ferdinand II., with sarcophagi of his parents, the Archduke Charles and his wife; thirteenth-century Gothic par. church of the Teutonic knights; Landhaus (1569), in Renaissance style; the Joanneum with natural hist. library, given by the Archduke John (1811); arsenal (1644); eleventh-century castle. The castle hill was fortified till 1809, and there is a curious clock tower on the Schlossberg. There are cold mineral springs at Radegund near by, and the health resort, Tobelbad. A polytechnic was opened 1888, and there are other educational institutions. Manufs. included machinery, rails, ironwares, paper, leather, soap, beer, hats, and wine. The lignite of Kainach valley, the chief mineral fuel deposit of the Alps, is important. G. fell to Soviet troops in the course of their advance on Vienna (April 1945). Pop. 153,000. See G. Fels, *Graz und seine Umgebung*, 1897.

Graziani, Rodolfo, Marchese de Neghelli (b. 1882), It. soldier and colonial administrator. Served in Eritrea from 1908 to 1913; in Libya, 1914. Held an infantry command in Macedonia in 1919. Served in Tripolitania for the next eight years. Took part in the occupation of Fezzan; general of div., 1928. Commander of the forces in Libya 1930-34, conducting operations which resulted in the occupation of the Kufra oasis and in the final pacification of the colony, which latter he accomplished with great brutality. Governor of It. Somaliland 1935-1936. Hon. governor of It. E. Africa,

1938. Commander-in-chief of the It. Libyan forces 1939. When Italy declared war on Britain and France in 1940 he advanced from Benghazi to the invasion of Egypt, the Brit. forces, vastly outnumbered, falling back slowly to Mersa Matruh. G., in his advance, built a series of powerful fortifications all the way to Sidi Barrani. In the winter of 1940-41 Gen. Wavell, commanding the Brit. forces, suddenly turned to the attack and inflicted on G. one of the most spectacular defeats in the hist. of warfare. G. endeavoured to disclaim responsibility by placing before the It. supreme war council the actual orders sent him by Mussolini for the conduct of the campaign, contending that in a series of dispatches he had opposed in the strongest terms the entire strategy conceived by Mussolini. He resigned in March 1941. After Italy's surrender in 1943, G. became defence minister in Mussolini's republican gov. In 1945 he surrendered to the Amer. and was imprisoned on Procida Is. until 1946, when he was handed over to the It. Gov. for trial.

Grazzini, Antonio Francesco (1503-83). It. poet and dramatist, founder of the Accademia degli Umidi (Florentine Academy), 1540, assuming the name 'Il Lasca' (mullet, or barbel). He was also later chief founder of the Accademia della Crusca (1550), formed to perfect the Tuscan language. His works include a collection of tales in the style of Boccaccio's *Decameron*—*La primu e la seconda Cena* (selections appearing as *Le Cene*, 1756); sonnets, satirical poems, and comedies; *La Gelosia* (1568); *La Spiritala* (1561); *I Parentadi*, *La Pinzochera*. His works were considered 'testi di lingua' by the Della Crusca Academy. See P. Fanfani, 'Vita del Lasca' in *Le Cene ed altre prose*, 1857, and ed. of the *Commedia*, 1859; P. L. Ginguené, *Histoire Littéraire d'Italie*, 1810-24.

Grease, see under HORSE (DISEASES).

Great and Little Bear, see URSA MAJOR and URSA MINOR.

Great Australian Bight, see AUSTRALIAN BIGHT.

Great Badminton, see BADMINTON.

Great Barrier Island, or Otea, is. of New Zealand, about 20 m. long, on the E. coast of N. Is. To the W. is a small is. known as Little Barrier Is.

Great Barrier Reef, series of coral reefs off the E. coast of Australia, about 1250 m. in length. In its widest part it is 100 m. broad and is 150 m. from the coast, but towards the N. it comes nearer the land, and in some places is only 10 m. distant. The reef can be seen at low tide, but can always be distinguished by the breakers which wash over it. It is not continuous but is broken up by many deep channels, the chief of which are the Bligh entrance, the Olinda entrance, the Ralmo entrance, and Flinders passage. The channel between the reef and the coast is a valuable route of communication for steamers owing to the calmness of the sea, but careful navigation is necessary, especially at night, when the reef can scarcely be discerned; hence sailing

vessels only use the route by day. The most valuable products of the reef are pearls, pearl shells, and trepangs.

Great Barrington, tn. in the Berkshire co. of Massachusetts, U.S.A., on the Housatonic R. about 12 m. from the S.W. corner of the state. It is a popular summer resort. The chief manufs. are cotton and woollen goods, electrical appliances, paper, etc. There is a good building stone quarried in the dist. The Sedgwick Institute is situated here. Pop. 5800.

Great Basin, large region of drainage in the U.S.A. which includes nearly all Nevada, Utah, Oregon, and California, and lies between the Sierra Nevada on the W. and the Wasatch Mts. on the E. Mts. run from N. to S. of it, and rise to a height of 4000 ft. above the plateau. The soil is fertile where irrigation can be applied, but the hills are barren. It has numerous lakes, most of which are salt, the chief being Great Salt Lake, Lake Utah, Lake Sevier, Lake Walker, and Lake Carson. The nits. are rich in minerals, especially silver ore.

Great Bear Lake, see BEAR LAKE, GREAT.

Great Britain, name in general use for the is. that contains England, Wales, and Scotland, together with the adjacent small is., such as the Isle of Man and the Isle of Wight. It is thus the larger part of the United Kingdom of Great Britain and Northern Ireland and the headquarters of the Brit. Empire. Its official date comes from 1603, when James I. united the crowns of England and Scotland and called himself king of G. B. But the constitutional use of 'Great Britain' as the title of the United Kingdom dates from the Act of Union, 1707, by which the Eng. and Scottish Parliaments were united and the commercial advantages of England thrown open to the Scots, while the estab. Church of Scotland and the Scottish laws and judicial procedure were secured. This article, which is exclusively historical, deals with the hist. of G. B. from the accession of George I. in 1714 as a convenient point to commence the hist. of the nation. (For the hist. of England prior to 1714 see ENGLISH HISTORY; and for Irish, Scottish, and Welsh hist. see IRELAND; SCOTLAND; WALES). The Protestant succession in 1714 was the final step in the revolution of 1688, the vindication of the principles of Protestantism and election of the monarch by Parliament. Further, it marked very distinctly a new era in the constitution. The king was a foreigner and a figurehead; the real power had passed from the hands of the Crown into the hands of the Parliament, and during the eighteenth century that meant that the power remained in the hands of the great Whig families. These families had been responsible for the revolution of 1688 and for the peaceful succession of George I., but they were inspired by no feelings of loyalty, rather they regarded the matter as a financial speculation, and supported the Hanoverians because, whilst a Protestant sat on the throne, their funds were safe. The first two Hanoverian kings had little,

if any, doubt as to the exact feelings of their subjects.

The first event of importance during the reign of George I. was the Jacobite rebellion of 1715, which was really of little importance and which hardly stirred the absolute apathy of the nation. During that rebellion the Septennial Act was passed, prolonging the duration of Parliament to seven years instead of three. This was obviously an Act passed in order to prevent an election during these troublous times, and was but a temporary expedient. It lasted, however, down to the passing of the Preamble to the Parliament Bill of 1810, which reduced the duration of Parliament to five years. One important development also took place. The king no longer attended Cabinet councils; his place was taken by a first or prime minister. The system of party gov. had been developed previously, but now the entire personal element of the Crown was eliminated. Under kings who simply regarded England as a source of revenue the plan worked well, but under more ambitious kings it was apt to become a trifling irksome. The mania for speculation, which broke out during this reign and was really one of the results of the treaty of Utrecht, culminated in the S. Sea Bubble, which broke, reducing many people in England to penury. The ministry could not entirely exonerate itself, but financial matters were put right by the genius of Walpole. From 1721 to 1742 Walpole ruled the country. This period of office was a period of stagnation; nothing happened, affairs dragged themselves quietly along, other countries took part in wars, G. B. stood aloof and prospered. Walpole was intensely fond of power and could brook no rival, hence we find during this period of office the Whigs themselves began to be divided, and the discarded rivals of Walpole led the opposition. The Patriots and the Bays were two such parties. In 1727 George I. had d. and his son had succeeded. George II. had no love for Walpole, but guided by his wife, Caroline of Anspach, he retained Walpole in office. In 1733 Walpole introduced his famous excise scheme, a scheme which was years ahead of his time, but withdrew it rather than resort to extreme measures. In 1739 he declared war with Spain, the war of Jenkins' Ear, which ran on into the war of the Austrian succession, and in 1742, finding his majorities continually dwindling, he resigned. It is important to notice during this century that in every war which G. B. fought we either were in direct opposition to France or ranged amongst the allies opposed to her. Also the wars were no longer European wars solely, but struggles for colonial and maritime supremacy. The European wars were repeated in India and America, and often even, when the two countries were at peace at home, war was going on in the colonies.

During the war of the Austrian succession the second and last Jacobite rising took place. Again it illustrated the apathy of the country at large, but this time, owing to more efficient leadership,

G. B. was invaded and the Pretender reached Derby. That day has since been known as Black Friday. The gov were seriously upset, the only person who scoffed at the danger being the king himself. But from Derby the pretender had to retreat and was finally defeated at Culloden and after many adventures got safely out of the country. At the battle of Dettingen in 1743 for the last time, a Brit sovereign led his troops in person. The war of the Austrian succession ended with the treaty of Aachen

throughout the country. He was succeeded in 1760 by his grandson, George III, eldest son of Frederick Prince of Wales, who predeceased his father George III (q.v.) was ambitious and had been dangerously educated. He proudly proclaimed, however, that he gloried in the name of Briton. Before he had been on the throne long, Bute his tutor, was in possession of the premiership. Pitt had resigned and a peace had been signed by which G. B. obtained much, but not so much as would have been obtained with a



THE BATTLE OF CULLODEN, APRIL 16 1746

This contemporary colour engraving, produced by courtesy of the Parker Galleries, Albemarle St., London, bears the following description. This View of the Glorious Victory obtained over the Rebels shews His Majesty's Army commanded by His Royal Highness the Duke of Cumberland drawn up in three lines. The Front consisting of Six Battalions of Foot, the Second of 5, the Third was a Body of Reserves composed of 4. Part of the Highland Army is here represented as furiously attacking with Swords and Targets to beat in upon the left of the Duke's front line where their rashness met with its chastisement from the Fire and Bayonets, of Barrels and Munro's Regiments. The right wing of the Rebel Army, covered by a Stone Wall, Kerr and Cebban's Dragoons and Hewart and Bland are described as passing through a breach made for them in it, to attack the rear of the Rebels, which put them into confusion. Kingstons Horse wheel'd off by the right of the King's forces and falling on the left of the Rebels met our Dragoons in their center which began the total rout of these disturbers of the British Empire.

(1748) and eight years later began the Seven Years' war. During this war Wm Pitt the Elder became minister for war and owing to his genius the war was the most successful that G. B. had yet waged. He set himself to conquer India and America on the plains of Germany. He instituted a system of financing the Brit allies, keeping France busy in that way on the Continent, while attacking at the same time India and America. During this war G. B. definitely established the beginnings of an empire in India, and Canada also passed into her hands. France had been defeated in both countries. Before the end of the war George II d. He had not been unpopular, and he was certainly respected

competent man at the head of affairs. The early part of the reign resolved itself into a struggle between the king and the Whigs. The king desired personal rule, and ultimately he, for a short time obtained it. One of the indirect results of the cession of Canada to Britain was the outbreak of war with the colonies. The king Parliament declared itself capable of taxing the colonies. The colonies protested that taxation went with representation. The gov., under Grenville, remained obstinate, the king regarded the colonists as rebels from the first. Conciliation was tried, but it was useless conciliating with one hand and irritating with the other, and finally, in 1775, war broke out and in

the following year the Amer. declared their independence and became a republic. By 1778 the war was extended and G. B. found herself fighting practically the rest of Europe. In America she was defeated at Yorktown, and the surrender of Cornwallis there in 1781 sealed the fate of America. Against France and Spain she was more successful, and the victories of Rodney in the W. Indies and the failure of the Spaniards to recover Gibraltar enabled G. B. to come out of the war with flying colours, but, nevertheless, at a lower pitch of power than she had reached before in the century. America's independence was of course recognised. The disasters of the Amer. war put a period to the personal power of the king, although he was still able to influence events by the use of the body of politicians known as the 'King's Friends.'

That series of changes in the economic world usually known as the industrial revolution began to become prominent just about this time. Change seemed to be in the air. The fiscal system was altered; the influence of Adam Smith's *Wealth of Nations* was felt; free trade began to be seriously spoken of; parl. reform found some bold and strenuous advocates, and then came the greatest event of all—the Fr. Revolution. For over four years that revolution remained disregarded by G. B., save in as far as it found some supporters but more enemies. The peace of Europe was held to be unaffected by it. Pitt himself declared the year before the outbreak of war that peace with France had never been so secure. Then, in 1793, Louis XVI. was executed and the international treaties of Europe were torn up by France. The republic desired to fight Europe, and speedily Europe found that the fight was not so unequal after all. But the enthusiasm of the revolution calmed down, the natural genius of the people slowly returned, and step by step they were led by Napoleon (q.v.) until the republic was a consulate and then an empire. Still the menace of imperial France was as great as that of republican France, and certainly it is due to the fact that it was impossible to invade and conquer G. B. that Europe was saved. Every other country in Europe suffered from actual invasion, but, as Pitt said, England saved herself by her courage and Europe by her example. Waterloo decided the fate of Europe, and Napoleon was sent to the is. of St. Helena. Undoubtedly the victory had been due to a very great extent to the resources of G. B.; without her manufs. even her enemies could not exist. The Berlin decrees failed owing to the number of exceptions which Napoleon had to make.

During the reign of George III. G. B. had begun to change from an agric. to an industrial nation. The new manufs. had led to new roads and new means of transit; it was obviously necessary to obtain quick transit for goods, and necessity was the mother of invention. Roads were better constructed, canals were made all over the country, and finally came the steamship and the steam-engine. The period which

followed the war was one of great distress. (*See under INDUSTRIAL REVOLUTION IN GREAT BRITAIN.*) The new machinery was attacked, and the increasing numbers of soldiers returning from the war made affairs worse. In 1819 the great riots broke out, and at Manchester the mob was charged by the military and a number of the rioters were killed; this event is known as the Manchester massacres or Peterloo. (For details see Prentice's *Manchester*, where it is stated that the assembly was 'peaceable' and that there was no riot.)

In the meantime the demand for reform had continued, but the revolution had stopped all chance of immediate reform. Anything savouring of reform was regarded as revolutionary, and anything revolutionary was anathema to the vast majority of the people of the country. Catholic emancipation had been mooted at the time of the Union (1800) (*see IRELAND, History*), but the king had refused to hear of it, and Pitt, rather than break his promise to the Irish, resigned. The king, who had now for some considerable time been incapable of ruling, d. in 1820, weak, old, blind, and insane. His son, the prince regent, became king as George IV.

The death of George III. in 1820 was in itself unimportant. The king had for long been imbecile and blind, and the accession of the regent made but little change. The effect of the revolution in France, however, was tremendous, and this intellectual awakening, stimulated by and stimulating the movement which we know as the industrial revolution, brought in its train results of the highest significance. There was more real progress in the nineteenth and early twentieth centuries than in most of the preceding hist. of the world. Democracy, hitherto an unattainable ideal became not only a possibility but, during the later years, a reality. During the reign of George IV. toleration became a real thing in spite of violent opposition; the Test and Corporation Acts were repealed, and a Bill for the relief of the Catholics was passed. These changes seem nowadays but small and necessary; to the age which passed them they were practically revolutionary. It is necessary also to remember tha' the close of the Napoleonic wars had been followed by a reaction in almost every country in Europe, and, in spite of this, revolutionary measures were passed in G. B.

In 1830 George IV. d. and was succeeded by his brother, William IV. In his reign the principles which were then called Radical largely supplanted the solid and, to a certain extent, unreasoned Toryism of the previous century, as may be gauged from the measures that were passed during this reign. The agitation for a Reform Bill at last had its reward in the passing of the great Reform Act of 1832, to the aristocracy of the time the beginning of the end of all things. Slavery was abolished, a Poor Law was passed, legislation for the protection of the worker passed, and the abuses of bor. patronage and trading privileges began to receive that critical attention which was to result in the Municipal Corporations Act of 1835.

In 1837 William IV. d., and was succeeded by his niece, Queen Victoria, whose long reign witnessed so much change and material progress. The early years of the young queen's reign witnessed the repeal of the Corn Laws and the great Chartist agitations, together with the beginning of the great Irish question. The year 1848 was called the year of the revolution; all Europe was in a state of unrest, and every side of the social fabric seemed to be agitated. The forties witnessed the Scottish Disruption movement and the Oxford movement, both indications of the state of unrest. Commercially G. B. was prospering and progressing by leaps and bounds. The great European wars had left her the workshop of the world, and for a time she had no competitors at all. Politically her progress was equally great, while the great parties still remained fairly true to the old ideas; nevertheless the Liberals, who represented the Whigs, and the Conservatives, who represented the Tories, were both being gradually tinged with the democratic spirit. The people were at last being recognised as a real factor in political existence, but this fact must not be overestimated. The power of the Crown and of the landed proprietors was as great as ever, but was skilfully disguised. The power of the House of Lords, although still great, was not great enough to compete with the Lower House, and gradually from this period the power of the House of Commons increased until it is now recognised as the greatest power in the legislature.

It will perhaps be best here to review as briefly as possible the main political events of the period from 1830 to the present time. The Reform Bill of 1832 stands out as the great event of the ministry of Lord Grey, and before this ministry relinquished office they had attempted the reform of the Poor Laws and had introduced the first Factory Act. Melbourne became Prince Minister in 1831, and although the ministry was dissolved by the king, the Tory minister, Peel, after trying to hold office with a minority in the House of Commons, resigned, and Melbourne continued in office until 1841. In 1839, defeated on a question of the affairs of Jamaica, he resigned, and Peel was again sent for, this time by Queen Victoria. The question of the change in the ladies of the bedchamber, however, roused so much difficulty that Melbourne was again induced to accept office. In 1841 he dissolved Parliament, and a Tory majority was returned. On the whole the ministry had not been very successful; they had passed the Municipal Corporation Act, and had introduced penny postage, but their policy in Canada and Jamaica had been bad, and the zeal for reform seems to have left the Whig party. The prin. event of the ministry of his successor, Peel, was the repeal of the Corn Laws (1846), which overshadowed his other successes. The Irish famine forced his hand, and the head of a nominal Protectionist ministry introduced the greatest measure of free trade which the country had yet been given. The 'betrayal of the party,' as many Con-

servatives considered it, was bitterly attacked by a young politician, Benjamin Disraeli (q.v.), the future leader of the Conservative party. Peel was almost immediately defeated on the question of a Coercion Act for Ireland, and resigned, never to hold office again. The Tory party was split up by this measure, and the Peelites, chief among whom were Gladstone and Aberdeen, ultimately joined forces with the Whigs to form the Liberals, whilst the Protectionists, under Bentinck and Disraeli, ultimately formed the Conservative party. Peel was succeeded by Lord John Russell, whose greatest difficulty during this period was the quelling of the Chartist riots. The Chartist demands were manhood suffrage, vote by ballot, ann. Parliament, payment of members, abolition of the property qualification, and equal electoral dists. Russell's plan was the presentation of a monster petition to the House of Commons, but the procession failed, and almost half the total number of signatures in the petition were found to be forged. In 1851 Palmerston's somewhat cavalier methods of conducting affairs at the Foreign Office led to his resignation, and in 1852 he threw the ministry out by defeating them on the Militia Bill. The ministry was succeeded by Lord Derby's first administration, and this, after a short period of office, was succeeded by a coalition ministry under the leadership of Lord Aberdeen. Its chief ministers were Aberdeen, Gladstone, Russell, and Palmerston. It lasted only for three years -- whence Disraeli's historic remark, 'England does not love coalition.' During its tenure of office, however, Gladstone definitely abolished all the remaining protective duties, and G. B. became altogether a free trade country. Nevertheless this ministry's utter mismanagement of the Crimean war led to its overthrow in 1855.

During the next ten years the outstanding figure in Brit. politics was Palmerston. After two years of office he was defeated, but appealed to the country and was returned by a large majority. Later, in 1858, his Conspiracy to Murder Bill was thrown out, and Lord Derby formed his second administration, which lasted only for fifteen months, after which Palmerston again came into power. From this time until his death Palmerston was supreme. The main events of importance were those concerned with foreign affairs. The position of France and the ambition of Napoleon III. made very many apprehensive of France. Gladstone, who was by this time a Liberal, was rapidly making a name for himself as a great financial minister. The invasion scare of 1858 led to the formation of the volunteers. In 1861 the Prince Consort d. In 1865 Palmerston d. and was succeeded by Lord John Russell, who attempted to pass a Reform Bill, but was so bitterly attacked by many members of his own party that he resigned, and was succeeded by Lord Derby. In 1867 Disraeli introduced a Reform Bill, and, 'educating his own party' up to it, passed

It was described by Lord Derby as 'a leap in the dark' and contained many amendments accepted from Gladstone.

From 1867 almost to the end of the century the field of politics is almost entirely occupied by the duel between Gladstone and Disraeli. Seldom have two statesmen of such genius been opposed to one another, or been so entirely different in character. In 1868 Disraeli became Prime Minister in succession to Lord Derby, but was defeated in the general election of that year and resigned before the end of the year. Disraeli was

returned to power having for the first time since 1841 a real majority in the House of Commons. The ministry formed by Disraeli was a brilliant one, and the opposition was for a time weakened by the withdrawal into private life of Gladstone. The question of Home Rule was gradually forcing itself to the front, and the Irish tactics in the House became obstructive. It was at this time that Disraeli put forward his imperial policy, and the ministry is chiefly noticeable for its attitude on foreign and imperial affairs. The Bulgarian atrocities led to the inter-



THE REFORM BILL 1867 'A LEAP IN THE DARK'

A cartoon by Sir John Tenniel reproduced by permission of Punch

succeeded by Gladstone who during the five years of his ministry passed more measures than almost any previous one. Education became compulsory, trade unions were legalised, the Ballot Act was passed. Under Cardwell the army was reformed, and the linked battalion method adopted. The Irish Church Act and a Land Act for Ireland were passed and the state of Ireland at that time had to Coercion Acts. But the ministry gradually became unpopular -- even those sections of the community that would benefit most from its measures turning against it -- whilst the foreign policy of the gov. was decidedly unpopular. G.B.'s action towards Russia during the Franco Prussian war and towards the Alabama claims of the U.S.A. being decidedly weak. In 1874 Gladstone resigned, and the Conservatives were

vention of Russo and to the Congress of Berlin from which G.B. issued in 1878 with 'peace and honour'. Affairs in Africa and India also attracted much attention the title of Empress of India was taken by the queen and the majority of the shares of the Suez Canal became the property of G.B. In 1880 however, Disraeli, or Lord Beaconsfield as he was now called, was badly defeated at the polling booth and resigned. The renewed enthusiasm of the Liberals on the reappearance of Gladstone and the 'swing of the pendulum' account to some extent for this. But as Disraeli remarked, 'hard times' was the chief cause. The influx of wheat from the Amer prairies, coupled with crop blights, did much to depress agic prosperity. Gladstone now formed his second administration. He again remained in power for about five years.

During that time he was much troubled by the Irish question, and the agrarian outrages in that country led to the passing of fresh Coercion Acts. In 1882 Lord Frederick Cavendish was murdered. In 1880 the Boers were, after the defeat at Majuba, granted independence, and in 1885 the Egyptian question, which had necessitated the bombardment of Alexandria in 1882, was marked by the murder of Gordon at Khartoum. In 1881 the second Irish Land Bill was passed, and in 1884 the Reform Bill became law. In 1885 Gladstone resigned and was succeeded by Salisbury, but he held office only for a short time. In 1886 at the general election the Liberals were again returned to power. Gladstone formed his third ministry, but his majority was dependent on the Irish. He determined, however, to introduce a Home Rule Bill, which led to grave dissensions in his own party. On a div. on the second reading he was deserted by Hartington, Chamberlain, and Bright, and was defeated by a majority of thirty. He appealed again to the country, and was defeated. Lord Salisbury now formed his second administration.

From 1886 to 1906, broken only by a short administration of the Liberals, the Conservatives were constantly in power. The introduction of the Home Rule Bill had seriously split the Liberal party, and later, at the retirement of Gladstone, differences became still more marked. The dissentient Liberals called themselves Liberal-Unionists, and refused at first to co-operate with the Conservatives. The chief members of the second Salisbury administration were Lord Randolph Churchill, Sir Michael Hicks-Beach, and Balfour. The Liberal-Unionists, however, gradually became willing to accept office, and in 1887 Goschen succeeded Lord Randolph Churchill as chancellor of the exchequer. In 1892 the Liberals succeeded to office, but after a second Home Rule Bill had been introduced and thrown out in the House of Lords, Gladstone finally retired and was succeeded by Lord Rosebery. In 1895 the Conservatives again came into power, and the Liberal-Unionists formed a coalition with them, the duke of Devonshire (Hartington), Lord Lansdowne, and Chamberlain accepting office. Chamberlain quickly made a name for himself as colonial secretary. In 1899 the Boer war broke out and was concluded in 1902. In the same year, after the Conservatives had again been returned to power at the 'khaki' election (1900), Lord Salisbury d., and was succeeded by Balfour. Queen Victoria, who had celebrated her diamond jubilee in 1897, d. on Jan. 22, 1901, and was succeeded by Albert Edward, Prince of Wales, his coronation, as Edward VII., postponed from June 26, 1902, owing to an attack of appendicitis, taking place on Aug. 9 of that year. During Balfour's administration the highly controversial Education Act was introduced, and in 1903 Chamberlain put forward the Tariff Reform scheme which succeeded in breaking up the Conservative party and

led to the overwhelming victory of the Liberals at the election of 1906. Sir Henry Campbell-Bannerman formed the first administration, and was succeeded shortly before his death by Asquith (1908). Edward VII. d. on May 6, 1910, and was succeeded by his second son George Frederick Ernest Albert, as George V., who was crowned on June 22, 1911. The rejection of the budget in 1909 by the House of Lords led to the introduction of the measure for the curtailment of the power of that House, and after a conference of the parties had failed, the Parliament Bill of 1911 was introduced and finally, after a great struggle, passed, since the Prime Minister obtained from the king a promise to create enough peers to swamp the Tory majority in the House of Lords if the Bill were thrown out. Mr. Asquith's ministry continued until 1915 as Liberal and continued as Coalition Gov. until 1916.

G. B.'s entry into the First World War on Aug. 4, 1914, subdued political differences, but the Home Rule Bill and the Welsh Church Bill became law automatically, being the first measures to be passed under the new Parliament Act (q.v.). In 1915 a Coalition Gov. was formed comprising twelve Liberals, eight Conservatives and Unionists, one Labour member, and Lord Kitchener. Legislation was passed to lessen any danger to war efficiency at home, especially with respect to war munition centres. In 1916 the Conscription Bill was passed. Industrial unrest at the Clyde munition works culminated in a series of strikes. The Defence of the Realm Act (q.v.) (D.O.R.A.) was applied and the leaders were deported. Meanwhile financial difficulties arose. The new entertainments tax (q.v.) was imposed. Adopted as a war measure it is still regarded as a source of normal revenue. In April 1916 Irish volunteers in Dublin, during what appeared to be a holiday parade, seized the prin. buildings, and a serious conflict with the regular troops took place. The rising was an expression of Sinn Fein (q.v.) hostility to the Brit. Gov. Civil war was proclaimed. The rebellion, however, was eventually subdued, though not before a hundred lives had been lost. An interesting domestic measure was the passing of the Daylight Saving Bill (q.v.). At first ridiculed as the originator of the idea, Wm. Willett, is now recognised as a public benefactor. The death of Lord Kitchener at sea left the war secretaryship vacant, and Lloyd George succeeded him. Zeppelin raids having taken place, lighting restrictions were enforced to minimise the conspicuousness of large tns. A food controller (see FOOD CONTROL), was appointed, and in Dec. Lloyd George became Prime Minister, being in close association with Bonar Law. In 1917 a new Irish Convention saw Irish prisoners released, among them Ramon de Valera (q.v.). Gen. Smuts accepted a place in the War Cabinet (see CABINET, IMPERIAL WAR), while the Whitley Councils were set up under the chairmanship of J. Whitley as a step towards

industrial peace. The protraction of the war by this time caused a system of 'rationing' of essential foods. At the end of the session (Feb. 1918) the People's Representation Bill was passed by which all men of twenty-one, and women of thirty, with residential or business qualifications, were given the franchise. Early in the same year the House of Lords gave its approval to the principle of the League of Nations (*q.v.*). In Sept. industrial disputes again occurred, charges of 'profiteering' were made, and increased pay was demanded. Meanwhile rumours of peace encouraged the Irish to agitate for a settlement of their claims, but the armistice had been signed before any definite step could be taken, and the end of the First World War meant the end of a war gov.

Parties returned to their old distinctive groups, though there was inevitable overlapping. The Labour party came back with greatly increased strength and challenged the Liberal position as the official opposition. Irish Nationalists practically disappeared, while the seventy-three Sinn Féiners refused to take their seats, among them being Countess Markievicz, the first woman M.P. They formed a Dail Eireann (*q.v.*) (assembly, of Ireland), and were the predominating force in that country. Gov. appointments included Sir S. B. Sinha, the first Indian member of the House of Lords, as under-secretary for India. In industrial relations peace presented her problems as insistently as war. The Miners' Federation called for nationalisation of mines, and formed with railwaymen and transport workers the Triple Alliance (*q.v.*). The Sankey coal commission settled the wages difficulty and recommended nationalisation, though its recommendation was not adopted. On June 28, 1919, the peace treaty was signed. In addition to its territorial and guarantee provisions, important industrial ambitions were included. Among social changes at home was the Women's Emancipation Bill, whereby women were no longer barred from professions hitherto restricted to men. During the year an industrial court (*see CONCILIATION*) was set up, composed of employed and employers, to settle trade difficulties. But Irish affairs continued to dominate domestic politics. A form of guerrilla warfare had developed. The Irish Self-Determination League demanded recognition of the republic and the evacuation of the 'English army of occupation.' In 1920 the Restoration of Order Bill did nothing to remedy the trouble, while added violence resulted from alleged reprisals by the Auxiliary Irish police known as Black and Tans. Martial law was proclaimed in many of the S. tns. With the intervention of Gen. Smuts in the following year a more favourable stage was reached, and eventually a truce was arranged, and Ireland was granted Dominion Home Rule. (*See also HOME RULE; EIRE.*) In 1922 confidence in the Coalition Gov. diminished, a general election took place, and a Con-

servative ministry under Bonar Law was returned to power. Labour became the second party in the House. The Conservatives, however, had no clear majority, and on Baldwin's fiscal policy another general election occurred, resulting in a stalemate.

At the general election the following year the Labour party assumed office under Ramsay MacDonald. In Feb. the gov. formally recognised the U.S.S.R. and in its first budget removed the McKenna duties (*q.v.*). Unemployment, now over the million figure, claimed immediate attention, and it was generally admitted that the problem was more difficult than any which the war had given rise to or aggravated. As foreign secretary MacDonald enhanced his reputation over his conversations with France respecting the Dawes reparations plan (*see DAWES PLAN*). But the gov.'s insecurity by this time had led to defeat, and once again a general election had to be faced. The notorious 'red letter' (*see ZINOVIEV LETTER*), alleged to have come from Russian Communists demanding propaganda among Brit. Communists, affected the election, and the Conservatives, under Baldwin, were returned to power with an independent majority. In industry class feeling had become bitter. The phrase 'class war' appeared in trade union literature. Mr. Churchill, in his first budget, reimposed the McKenna duties. Unemployment gave rise to alarm. In the coal industry many mines were closed and many areas were reduced to destitution, especially in S. Wales and in the N. of England. Meanwhile the Locarno Treaty (*q.v.*) was signed, and Germany was free to enter the League of Nations. In 1926 disturbances in China caused some misgiving. Civil war between Cantonese and Pekinese forces endangered Brit. lives and property, and troops were dispatched to Shanghai. Fresh concern was caused by events in the coal industry. Negotiations having failed a general stoppage resulted, which led to the general strike (*see STRIKE, GENERAL*). The Emergency Powers Act of 1920 was invoked and the gov. took control of necessary supplies. Eventually the strike spread to the railways, transport workers, newspapers, and iron and steel trades. Two and a half million men ceased work. By the time it was called off £30,000,000 had been lost. A Bill to secure longer hours in the mines was passed and discontent grew unchecked until Nov., when agreement was reached. Various expedients were tried to mitigate unemployment, among them the Industrial Transference Board, by which men were transferred to likely areas, and training schemes. There was unrest in the cotton industry and a deadlock followed protracted negotiations. Mr. Churchill's budget of 1928 was notable for its de-rating scheme (*see DE-RATING*), a policy of granting rating relief to depressed industries. In April diplomatic friction occurred with Egypt over certain legislation which offended Brit. military obligations, and not until warships were

dispatched was the crisis avoided. The gov.'s Trades Unions Bill aroused fierce opposition from its Labour critics. By it a general strike was declared to be illegal, but in spite of violent criticism it became law. A diplomatic sensation was caused during the year by the police raid on Arcos, a Russian trading agency, and relations were severed with Russia as a result of the discovery of subversive

original scope, and now, as the Local Government Bill, pursued a stormy passage, while unemployment had reached the ominous figure of over 1,500,000. The gov.'s Franchise Bill, whereby women received the vote at twenty-one (see ELECTIONS), and a desire for safeguarding duties among its supporters, led to a general election. Labour returned to office, though without a working majority.



Topical Press

**THE SIGNING OF THE LOCARNO TREATY IN THE GRAND ASSEMBLY ROOM
OF THE FOREIGN OFFICE, LONDON, OCT. 16 1925**

Seven representatives of the subscribing powers put their signatures to the historic document in the Grand Assembly Room at the Foreign Office. Left to right, starting with Mr. Baldwin, Prime Minister, at the top table, are Sir Austen Chamberlain, foreign secretary; Sir Cecil Hurst, legal adviser; Mr. M. W. Lampson, M. Briand, French Premier; M. Berthelot; Dr. Beneš, foreign minister, Czechoslovakia; Count Skrzynski, Prime Minister, Poland; M. Prezazieki; M. Vandervelde, foreign minister, Belgium; M. Rolin, Herr Kempner; Herr von Schubert, Herr Stresemann, foreign minister, Germany; Dr. Luther, Prime Minister, Germany; Marquis Medici; M. Pilatti, Signor Scaloja, Locarno delegate. Behind Mr. Baldwin is Mr. Winston Churchill.

propaganda. Nation-wide interest was aroused later by the revision of the Prayer Book (see also DAVIDSON, LORD). Parl. sanction was sought for its voluntary adoption. The measure was thrown out amid acrimonious hostility. In agriculture a further anxiety beset the gov.: the industry demanded gov. aid, and, receiving none, voiced its grievances with an emphasis which had its effect on the subsequent general election.

The beginning of 1929 saw political struggles overshadowed by the serious illness of the king, who was successfully operated on for pleurisy. Meanwhile the De-Rating Bill had grown beyond its

Awaiting the new gov. were unemployment, new treaties with Russia and Egypt, and the ratification of the Anglo-American naval pact, sponsored by F. B. Kellogg, Amer. diplomat and lawyer. The threatened lock-out in the cotton industry took place in July, and after a stoppage of three weeks by 500,000 operatives, a return to work was effected by arbitration. By Aug. relations with Egypt were amicably settled, and the acceptance of the Young plan of reparations at the Hague coincided with the evacuation of the Rhineland (q.v. and see also REPARATIONS), and Ramsay MacDonald successfully terminated con-

versations with Hoover, thus accepting the Kellogg Naval Pact (*see also LONDON CONFERENCE*). A form of agreement was once again arranged with Russia, and the Unemployment Insurance Bill with its benefits was finally passed. But by 1931 unemployment had reached the startling figure of over 2,000,000, and it became clear that the question was one which must be considered irrespective of party politics.

G. B.'s financial and economic situation, after only a year or two of Labour government, deteriorated in a marked degree, the unemployment figures reaching over 2,800,000 in 1931, while a budget deficit of £10,000,000 was shown to be imminent (report of Sir George May's Committee, 1931). Yet neither misgovernment nor prodigality need be imputed to the Labour Gov., since, on the one hand, their tenure of office coincided with a world economic crisis and, on the other, the sums they were prepared to spend on social services, judged by really progressive standards, were by no means excessive. Actually the gov. went out on the issue of a low tariff on imports and was succeeded by a Coalition or National Gov. of all parties under Ramsay Mac' Donald, one of the first acts of the new go., being the abandonment of the gold standard in order to avert the collapse of the £. After the National Gov. (*q.v.*) had been returned a second time and by a great majority, Neville Chamberlain, chancellor of the exchequer, reversed the country's traditional free trade policy by introducing the Import Duties Bill, 1932, under which Britain's fiscal policy now became protectionist. The same year saw the passage of the now historic Statute of Westminster (*q.v.*), which, by giving extra-territorial operation to the legislation of the Parliaments of the self-governing dominions, in effect rendered those countries independent of G. B. for all purposes. By now the nation's financial outlook had so far been redressed as to show a budget surplus in 1932 of over £31,000,000—a recovery so rapid as to lend some support to the contention that it could hardly have been so black as it was painted only a few months previously. But no appreciable decline in unemployment came until 1934, the serious state of the Lancashire cotton industry being one disturbing factor and the more so from the flooding of markets by cheaply produced Jap. textiles. But in 1936 unemployment showed a further decline in consequence of the improvement in the iron and steel industry—which had been under a cloud ever since the close of the First World War—through the gov.'s plans for rearmament in reply to Hitler's policy in that direction. Domestic policy indeed was now overshadowed by considerations of foreign policy and the exigencies of national defence. In the Far E. Japan's expansionist ambitions had their repercussions in G. B.'s naval policy; while Mussolini's designs in Abyssinia, with their implicit threat to Brit. interests in the Near E., involved in the Brit. Gov.'s view a discussion of

G. B.'s obligations under the Covenant of the League. The policy of economic sanctions against Italy effected nothing owing to the backward state of Brit. rearmament, and merely served to embitter relations for some years between the It. and Brit. peoples (*see further under ABYSSINIA*). But the National Gov., which had been once again returned to power in 1935, was in an awkward situation, being pledged to pursue an active policy against Italy and, at the same time, receiving no real support for that policy from France, whose evil genius in this as in many other matters subsequently was Laval (*q.v.*). At this juncture Sir Samuel Hoare, Brit. foreign secretary, and Laval, Fr. Premier, concluded a pact by which Italy was to receive substantial concessions at the expense of Abyssinia. The Brit. Cabinet, however, repudiated the pact, and Sir Samuel Hoare was replaced by Mr. Anthony Eden, a minister who was also destined to suffer temporary eclipse until the outbreak of the Second World War.

The year 1935, the silver jubilee of George V., was celebrated in May amidst unprecedented enthusiasm; but in the next year the popular monarch d. at Sandringham (Jan. 30) and was succeeded by Edward, Prince of Wales, as Edward VIII. The new king reigned for less than a year, abdicating on Dec. 10, 1936, uncrowned, in consequence of manifestations of widespread distaste in regard to his proposed marriage to Mrs. Wallis Warfield (formerly Mrs. Ernest Simpson), an Amer. subject. He left England immediately afterwards and married her in France the following year (*see EDWARD VIII*).

Early in 1936 the international situation underwent further serious deterioration through Germany's denunciation of the Locarno Treaty, ostensibly as a counterpoise to the futile Franco-Soviet Pact. Italy had by now completed the conquest of Abyssinia, the only course open to G. B. being to carry out rearmament on a larger scale, her existing forces, particularly in the air, being totally inadequate to ensure any respect from the dictators. Provision was made for the immediate expenditure of £300,000,000, chiefly on new naval and air armaments. When, however, Germany occupied the demilitarised Rhine land zone, the Brit. Gov. evinced a measure of sympathy towards Hitler's professions of peaceful intentions as outlined in a comprehensive peace plan—a plan, however, which left much to be clarified if it were really to form the basis of a binding treaty. The Brit. Gov.'s view was that the situation had so developed that Germany could signify that she at least recognised and intended to respect the existing territorial and political status of Europe. It was the gov.'s view too that if any W. air pact were made, it should be accompanied by a regional agreement for limitation of air strength.

During 1937 the international situation appeared to be steadily growing worse. The desire of the nations for collaboration

with one another was often expressed and as often frustrated. Two wars were in progress—the Sino-Jap. war and the Sp. civil war. Japan and Germany had both left the League of Nations before the year ended. In many centres of pop. there were realistic rehearsals of measures of defence against attack from the air. Had G. B. at that time been blessed with a strong Prime Minister the fatal policy of appeasement might not have been continued and the rate of rearmament could have been to a great degree accelerated. But the repeated warnings by Mr. Winston Churchill of the growing Ger. menace fell on unwilling ears in the Commons and the public was apathetic. Indeed it remained, if not apathetic, unrealistic in its attitude towards G. B.'s danger even for many months after war had broken out in 1939. Regarding the civil war in Spain, the Brit. Gov. pursued the policy with France of 'non-intervention' and, at the same time, strove to bring about the withdrawal from Spain of It., Ger., and Russian 'volunteers'—representing the rival ideologies of Fascism and Communism. Italy was not in a position to proceed much further in this adventure in view of her commitments in Abyssinia, and Germany, while not concealing her resolve to control her own destinies, continued to proclaim the essential peacefulness of her intentions. The great problem of the Brit. Gov. was to devise the appropriate means of approaching Germany with the view of initiating useful discussions of her desires, needs, and grievances. It was recognised that the way towards appeasement through the approach of G. B. and France to Germany would be long and difficult, yet under the lead of Neville Chamberlain, who this year had succeeded Lord Baldwin as Prime Minister, the hope of accomplishing something practical by these means was not abandoned; and indeed Chamberlain held on his course even to the fateful meeting with Hitler and Mussolini in 1938 at Munich where, even if his policy was unpopular with a considerable part of the Conservative elements of G. B., he did undoubtedly postpone war for a year during which some of the leeway in rearmament may have been made up. Almost equally problematic, too, were Brit. and other foreign interests in China. In this year the coronation of King George VI, and his consort, Queen Elizabeth, was solemnised at Westminster Abbey (May 12)—an event which announced, in anxious moments, the unanimous intention of the Brit. Commonwealth to stand, through the renewal of this ancient symbolism, by its well-tried institutions and traditional loyalties. Another event at this time of importance to Brit. interests was the conference of imperial Prime Ministers, which took place in London in the month of the coronation. The dominions represented at this conference were mentioned for the first time by name in the coronation oath as taken by King George VI. The year closed with the country united on the main issue of rearmament. To raise the means to this end the rate of income tax

was increased, a special tax was imposed on business profits—foreshadowing the policy of taking or endeavouring to take the profit out of war—and a large loan floated. It was evident that only on the basis of being well armed could G. B.'s foreign policy take a firmer line without, at the same time, incurring contempt and the charge of opportunism. In the sphere of domestic legislation a notable social reform was the Matrimonial Causes Act, which enlarged the grounds for divorce (see DIVORCE). In education matters of interest were the laying by Queen Mary of the foundation stone of the new Bodleian extension and the completion of most of the building of the new administrative headquarters of the Univ. of London—destined, however, in 1939 to become the seat of the Ministry of Information in the war period.

The threats to the peace of the world, which had thrown their shadow over the close of 1937, grew rapidly more imminent and more specific in 1938, and the year was marked by successive crises, each passed without universal catastrophe, but always leaving a sense of heavy foreboding. The sombre events in the Sp. civil war, which was now approaching its final stages, and the implacable fighting in the Far E., played their part in the ultimate collapse of the international system created at Versailles, and in enhancing the pitfalls of G. B.'s foreign policy. Hitler now assumed command of all the armed forces of the Reich, thus proclaiming the restoration of Germany to her full military strength and her reliance upon that strength in seeking a remedy for her grievances. Early in the year Mr. Anthony Eden, foreign secretary, left the gov. of Neville Chamberlain owing to a difference of opinion with the Prime Minister over Anglo-It. relations. Mr. Eden based his policy on the hope of reasserting the diminished authority of the League of Nations. Chamberlain, while not denying the ideal of collective security on which the league had originally been founded, preferred to postpone the re-establishment of the ideal to a settlement of international problems by direct negotiation with aggrieved nations. Events, however, were moving too swiftly for conciliatory action, and, by the beginning of Sept., all the great powers of Europe were ranging themselves for a conflict more terrible than that of 1914. The arrogance of the Ger. Gov. over the Czech frontiers (see CZECHOSLOVAKIA) seemed to make war inevitable and, as France had guaranteed Czech integrity and G. B. stood pledged for the ultimate security of France, G. B. was immediately involved. But in Sept. Chamberlain, now a man of seventy years of age, resolved to make an unprecedented personal effort to avert the catastrophe. Travelling for the first time in his life by aeroplane, he sought a direct interview with Hitler in his home at Berchtesgaden and followed this journey by two other flights to Germany in order to secure the acceptance of a plan agreed upon with France, which, in effect, called upon

Czechoslovakia to make heavy sacrifices in the cause of peace. In the same month the Brit. Navy was mobilised and, on Sept. 28, the famous Munich Conference was held, at which Chamberlain signed (Sept. 29) with Hitler a declaration pledging their two countries to seek peaceful means of settling any future differences arising between them. Chamberlain sincerely believed that he had, in his own words, 'brought back peace in our time'; but most neutral opinion justifiably regarded the declaration on Hitler's part as worthless and hypocritical and the whole transaction as a betrayal of Czechoslovakia. In G. B. rearmament for the forces and recruitment and training for civilian defence proceeded with greater intensity than in the previous year, for the alarms of the Sept. crisis outweighed in this respect the new hopes engendered by the Munich pact, and to meet the cost of this movement the budget raised the income tax to a level unprecedented in time of peace. Civilian training for air-raid precautions (see A.R.P.) became a major national preoccupation. Many local authorities made issues of gas-masks. Meanwhile, however, an agreement with 'Y' for stabilising relations in the Mediterranean and the Near E. had a stormy reception in Parliament, being closely associated with the resignation of Mr. Eden and with the tardiness of the reduction of the foreign forces in Spain, which had been made a condition of bringing it into effect. Another notable, if inconclusive, agreement signed this year was that under which the Brit. Gov. and that of Eire composed long-standing differences over the payment of land annuities and the Brit. occupation of certain S. Irish ports. The evacuation of these ports was a political blunder of the first magnitude and was bitterly regretted when its consequences to Brit. shipping were fully realised during the Ger. submarine blockade in the Second World War. Popular confidence in the strength of Anglo-Fr. bonds was confirmed (July) by the success of the state visit of King George and Queen Elizabeth to Paris, and a visit (Nov.) by Chamberlain and Lord Halifax, who had succeeded Mr. Eden, seemed to emphasise the closeness of Brit. political and military collaboration with France. In 1939 foreign policy still dominated all other political issues in G. B., and nominally the gov. was still wedded to 'appeasement,' though, by now, Chamberlain did not refrain from free criticism of the Nazi regime, while the gov. rejected outright Hitler's claim for colonies. The curious feature of Chamberlain's foreign policy was that he still reposed implicit trust in the document he had brought back from Munich and, in spite of caustic comment in the press, he not only adhered to the idea of personal contacts between heads of gov. but retained more strongly than ever his hold on the Conservative party. He also paid a visit to Rome to see Mussolini. But despite his diplomatic activity the international position remained unaltered.

The work of rearmament went on with as much vigour as was then possible without a complete overhaul of industrial organisation. Public anxiety in the progress of air-raid precautions increased as the previous detached view of the danger of war yielded to a growing apprehension of its approach. Sir John Anderson, lord privy seal, announced that the gov. would provide steel shelters for the protection of the horns of occupants of small houses—shelters which were soon popularly known as 'Andersons.' Volunteers were enrolled for air-raid precautions services. About this time the Irish Republican Army, taking advantage of the agitation in Eire to abolish partition, organised a number of bomb explosions in central dists. of London and Manchester in an effort to intimidate the Brit. Gov. into incorporating N. Ireland in Eire. This campaign, which was encouraged by foreign agents, was soon suppressed after some of the malefactors were hanged for the murder of victims in Coventry. Another agitation in London was staged by Communists in an endeavour to compel the gov. to supply arms to the Span. Republican Gov., but the gov. adhered to its policy of non-intervention, and, in any case, as Franco was in possession of most of Spain, it was impossible to regard the Span. Republican Gov. as the sovereign gov. of that country. Realising that if war came the civilian pop. would be involved the gov. pledged itself in time of war to pay compensation to injured civilians on a scale appropriate to the private soldier recruited for the army, on the principle that civilians would be exposed to a common danger. Compensation was also promised for loss or damage to stocks of commodities in order to secure the continued flow of necessary supplies. But the Prime Minister still repeated his remarkable conviction that Germany had no more intention of aggression than had Britain. If that were so the logical conclusion was that for G. B. to rearm on its present scale was folly; but Chamberlain met this argument with the retort that this was the only way to make Germany desist from its folly. The only inference to be drawn would seem to be that Chamberlain was playing for time and no longer had any real belief in appeasement. Yet after Hitler had overrun Czechoslovakia, he still held on his course of substituting the method of discussion for that of force in the settlement of differences. It was, however, becoming ever clearer that the gov. was completely out of touch with the Brit. people, who were furious at this latest Nazi outrage on the liberty of other nations. The first sign of any change in the gov.'s policy was the opening of consultations with Russia on the possibility of Ger. aggression in S.E. Europe, but the discussions led to no concrete result. On March 31, when the air was full of rumours of Ger. designs on Poland, Chamberlain announced that G. B. would lend its support to Poland if that country were attacked. Again, when Italy overran Albania, the Prime

Minister announced that, in the event of any action which threatened Greece or Rumania, G. B. would lend those countries all the support in her power. These pledges marked the end of the much-criticised appeasement policy and the gov. now prudently introduced a limited measure of conscription by calling up for military training men of the ages of twenty to twenty-one and by doubling the strength of the Territorial Army. Having given guarantees to Greece and Rumania, the gov. realised the importance of securing the assistance of Turkey, and negotiations with that country were entirely successful. Chamberlain was in fact making every effort to build up a 'peace front,' but his hopes of getting the adhesion of Soviet Russia were disappointed. In May the king and queen made a tour through Canada and, by invitation of President Roosevelt, the tour was extended to the U.S.A. They were to have sailed in the *Repulse*, but the threat of war made it impossible to spare the battleship and they sailed in the liner *Empress of Australia*. Early in June a disaster, recalling the loss of the ill-fated airship *R101* in 1930, stirred the sympathy of the whole nation: while carrying out trials in Liverpool Bay the submarine *Thetis* (which was built at a cost of over £350,000), after submerging, failed to rise at the appointed time and, though she was soon located, all efforts to raise her failed, and of over 100 men there were only four survivors. With the Ger. threat to Danzig (July) and flagrant violations of Polish rights there, the approach of war was now obvious. The spirit of the nation, however, had by now become thoroughly inured to the prospect of war, and on all sides it was recognised that Nazi methods were incompatible with any settled order in Europe. On the eve of the Ger. invasion of Poland Lord Halifax (foreign secretary) reiterated (G. B.'s resolve to stand by that country (Aug. 24). G. B. went to war with Germany on Sept 3 (see WAR, SECOND WORLD, Causes).

Under the National Service Bill all men from the age of eighteen to forty-one, apart from a number who were excepted, were made liable to be called up for military service, the text of the Bill following closely the provisions of the Military Training Act passed earlier in the year. Another Bill was passed to implement the gov.'s promise to provide grants in respect of injury or death of the civilian pop. An Emergency Powers Act was passed at the same time which empowered the gov. to do almost anything for securing the public safety, maintaining order, and prosecuting the war. Large-scale evacuation of children and mothers was carried out from London and other big cities, leading to serious educational and social problems. Owing, however, to the fact that there were no air raids in the early months of the war, many of these returned to their former homes, and for many months the people of G. B. appeared mostly to be following their ordinary avocations and pursuits, a state of things which was

destined to be rudely interrupted after the fiasco of the Norwegian campaign, and which finally ended with the defeat of France. The gov. set its face against any statement of war aims beyond that of winning the war and therefore did not repeat the mistake made in the previous war, when a ministry of reconstruction was appointed which made fancy plans for creating a new world, only to be followed by disillusionment.

It may be said that during the first nine months, while Chamberlain was Prime Minister, the war was not being prosecuted with the efficiency or vigour necessary to ensure even the possibility of ultimate victory. Critics of the gov. felt that to achieve the impulse demanded by war in modern conditions, there should be a gov. representing all parties in the state. The gov. was roundly charged with being half-hearted in its determination to speed up industrial production to the requisite level. The Labour leaders had declined to take office in Chamberlain's gov., and, until they should change their minds, it was difficult to get the full support of the trade unions behind the national war effort. Matters came to a head with the utter failure of the Norwegian expedition (see NORWAY AND DENMARK, GERMAN INVASION OF (1940)), and the various elements of discontent boiled up in a debate in the Commons in which Mr. Amery summed up the feeling of the effective majority when he addressed to the Prime Minister the words of Cromwell to the Long Parliament, ending in the cry 'In God's name go!' Despite a loyal speech by Mr. Churchill, the motion of confidence was carried by so small a majority that Chamberlain felt bound to resign. Mr. Churchill formed a new administration within a few hours, and the prin. Labour leaders entered the gov. in the War Cabinet and in the crucial ministries of Labour and Supply. The new gov. met Parliament on May 13, 1940, when Mr. Churchill, veritably the captain of the nation, made the first of a series of memorable speeches which heartened the nation in dark and dangerous days and impressed the friends of freedom throughout the world. In a famous passage he said on that occasion: 'I should say to the House, as I said to those who joined the government, I have nothing to offer but blood, toil, tears, and sweat.' The new gov.'s policy, he said, was to wage war with all their might and their aim was victory; victory at all costs, victory in spite of all terrors. This, at long last, was realistic language, and though still darker days lay immediately ahead, with the approaching collapse of France and the evacuation of Dunkirk, the nation now knew what to expect and through all vicissitudes stoically bore its burdens. On May 22 Parliament passed the Emergency Powers (Defence) Act, which gave the gov. complete power of control over persons and property for the prosecution of the war. The collapse of France (see WESTERN FRONT IN SECOND WORLD WAR and FRANCE, History. Causes of French Collapse) caused a situation of extreme peril

for G. B. On her coasts the danger was obvious and imminent, since the enemy's first object after his conquest of France and the capture of the whole of the equipment of the Brit. expeditionary force, was to mass his armies in and about the channel ports and to assemble a large fleet of transports and barges, apparently intended for an invasion of the Brit. Isles. A 'Home Guard' (*q.v.*) of part-time soldiers was hastily enrolled to assist in the defence of their factories and homes. But it was evident that as the Ger. did not command the sea, they could not hope

which they avoided heavy casualties at the cost of giving up their hope of destroying the defending air force and also at the sacrifice of anything like accuracy of aim. Their attacks were now made on the great tns., especially London, and were directed with scarcely any pretence of seeking military objectives. The Brit. civilian pop., facing an ordeal unique in their hist., showed a fortitude that became the wonder of the world. The king and queen set an example by refusing to leave their own bombed home, except to pay sympathetic visits to whatever tn. seemed for



THE HOME GUARD, NEAR DOVER

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to land an invading army with any chance of success unless they first secured complete mastery of the air over the channel and the Brit. Isles. In the middle of Aug. they began air operations on a large scale with this end in view, and battles between large forces occurred almost daily for over a month. In these battles the R.A.F. fighters, though always heavily outnumbered, at once demonstrated a decisive individual superiority over their adversaries, inflicting on the average at least four times as many casualties as they suffered. By the middle of Sept. it was clear that the Ger. were suffering ruinous loss—in one day (Sept. 15) 185 Ger. planes were shot down over Great Britain—and were no nearer to their objective of obtaining sufficient mastery of the air to launch their projected invasion (see OPERATION SEALION). They then abandoned the massed assaults by daylight and adopted the policy of night raiding, in

the moment to be suffering most acutely, and to inspect the forces and all kinds of national effort. The Ger. menace to the new world, obvious in the Tripartite Pact, drew closer the bonds of sympathy between G. B. and the U.S.A., and the return of Franklin Roosevelt for his third term was due mainly to this sympathy and to the realisation that continuity of administration was the best guarantee that help in planes, guns, tanks, and other war material would be both effective and speedy. Losses at sea and the diversion of labour and shipping to war purposes necessitated a great curtailment of goods available for civil consumption and accordingly the rationing system became progressively more severe. In the financial year 1940-41 income tax rose to 8s. 6d. in the £, while a tax on purchases, ranging up to 33½ per cent, was placed on nearly all goods not already taxed. The gov.'s appeal for national saving met

with a great response, and 'Spitfire' and other fighting and relief funds were widely supported. On Sept. 7 London was bombed without cessation for many hours. The most savage attack was concentrated on dockland, creating an enormous fire problem. Something of the kind had been prepared for, but the strain on the service was very heavy. Fire-fighting organisation was, however, rapidly developed and, as a result, every situation that arose after that time was adequately met. On Dec. 29 another fierce onslaught was made on the city of London, the evident intention being by means of incendiary bombs, to be followed later by high explosives, to destroy the commercial heart of the empire by fire. Though fierce while it lasted the raid ceased suddenly and the work of extinguishing the bombs was quickly put in hand. In this fire many Wren churches of great beauty were destroyed, including St. Bride's, Fleet Street; St. Lawrence, Jewry; St. Stephen, Coleman Street; Christ Church, Greystars; St. Leonard, Foster; St. Mary, Aldermanbury; St. Andrew by the Wardrobe, and St. Mary Woolnoth. Dr. Johnson's house in Gough Square was gutted, Trinity House and a number of the old city halls were demolished, and many streets were severely damaged, including Newgate Street, Cheapside, Alder-gate, London Wall, St. Paul's Churchyard, Paternoster Row, Tower Hill, and the Minories. Many newspaper offices and publishers' houses were gutted. The famous 500-year-old London Guildhall was also destroyed, and business premises were grievously damaged. The orgy of destruction, failed in its purpose, but the lesson that buildings, when otherwise unoccupied, should be guarded against a similar danger recurring was brought home to the people by the gov. and press, and very soon compulsory fire-watching services were ordered by the home secretary. Provinces and tns. were also heavily raided, especially in Nov. 1940. Coventry suffered appalling damage (Nov. 16), the famous cathedral being almost destroyed, together with the chief shopping centre. In Manchester the Free Trade Hall was burnt out and a large part of the Royal Exchange. The Elizabethan St. Peter's Hospital, the Dutch House, and the Univ. Great Hall (opened in 1925) in Bristol were destroyed. Other tns. to suffer very grave damage to shops, offices, churches, and dwelling houses were Birmingham, Southampton, and Sheffield (Nov.-Dec.). Many famous buildings in Britain were used as targets by Ger. raiders and damaged more or less severely; these included the following:—*Churches*: Westminster Abbey (at least twice); St. Paul's Cathedral; St. Martin-in-the-Fields; St. Clement Danes (twice, being burnt out on the second occasion in 1941); St. Giles, Cripplegate; St. Swithin's, Cannon Street; St. Augustine, Watling Street; St. Margaret's, Westminster; Christ Church, Westminster Bridge Road; Canterbury Cathedral; and Exeter Cathedral. *Hospitals*: St. Thomas's; Great Ormond

Street; London Hospital; Queen Mary's Hospital; St. Bartholomew's Medical School; Charterhouse Clinic; St. Dunstan's headquarters; Royal Hospital; Chelsea; and Ford's Hospital, Coventry. *Famous buildings*: Buckingham Palace; St. James's Palace; Kensington Palace; Lambeth Palace; Eltham Palace; House of Commons (the debating chamber gutted in May 1941); House of Lords; Brit. Museum; Law Courts; Tate Gallery; the Old Bailey; Imperial War Museum; Queen's Hall (burnt out); Somerset House; Hertford House; Burlington House; Tower of London; Westminster Hall (at least twice); Temple; Inner and Middle Liberties (very serious damage); Stationers' Hall; Radnor House, Twickenham; Australia House; Bank of England (near); Co. Hall; Muir Tussaud's; National City Bank of New York; Public Record Office; S. Africa House; Univ. College Library; Y.M.C.A. headquarters; the Zoo; Royal Empire Society, Northumberland Avenue; Royal College of Surgeons; Argyle Theatre, Mersey-side; Arts Theatre, Birkenhead; Birmingham Art Gallery; and Birmingham Art. hall. *Clubs*: Arts Club, Dover Street (almost demolished); Carlton; and Reform (see also under LONDON). Very considerable damage was done to business premises, shops, and other buildings in the spring of 1941 in Plymouth, the Mersey-side, Glasgow, Swansea, Bristol, and other ports, this being part of the effort to crush Brit. trade in the so-called battle of the Atlantic. (For further details of damage see under the names of cities and towns).

Mr. Churchill's prestige as G. B.'s war leader remained undimmed throughout the war. When events culminated towards the end of 1941 in the marshalling of a world-wide alliance of great powers against the aggressor nations there was an enhanced appreciation of how much his leadership had contributed to this since the period when, immediately after the fall of France, G. B. and the commonwealth faced a terrible menace undaunted but alone. In particular his prompt declaration of G. B.'s full support for Russia, after she was invaded by the Ger. armies, his historic meeting at sea with President Roosevelt and the framing of the Atlantic Charter (q.v.), and his further visit to Washington (Dec.) to promote the co-ordination of the war effort of the Allies, were recognised as decisive marks of statesmanship. The increasing scale of Amer. aid for G. B. before America formally declared war on the Axis, and the growth of collaboration in every sphere between the two countries also owed much to Mr. Churchill's handling of Anglo-Amer. relations. War finance became more stabilised. G. B.'s total expenditure in the year ended March 31, 1941, was £3,881,000,000 of which £1,409,000,000 was raised from revenue and the balance borrowed. The standard rate of income tax was increased to 10s. in the £ and the reduction of the exemption limit to £110 a year increased from 2,000,000 to 7,800,000 the number of persons liable to tax. The object of this heavy new taxation was not merely to raise revenue

towards paying for the war, but also to reduce purchasing power in the hands of the public as a safeguard against inflation. By Dec. war expenditure had reached the rate of nearly £83,000,000 a week, or nearly £11,750,000 a day, while G. B.'s total expenditure during the war had by that time reached £8,300,000,000. Organisation of man-power and woman-power developed rapidly. Compulsions were extended in seven directions, notably for the recruitment of the women's auxiliary services and for the transfer of workers to the making of munitions from industries less important in wartime. Concentration of industries possessing surplus labour and factories became public policy directed by the Board of Trade. There were large applications of the Essential Works Order to control the supply of labour in shipbuilding, railway transport, dock transport, building, coal-mining, and also agriculture. The second National Service Act received the royal assent on Dec. 18, when a proclamation was signed by the king calling up women between twenty and thirty years of age. The Act declared that a liability rested on all persons of either sex to undertake some form of national service, and it fixed the higher age limit of the National Service Acts at fifty-one and extended their application to women for the purpose of maintaining the women's auxiliary services. Married women and women with a child under fourteen were exempted from conscription.

Over the broad field of strategy throughout the year the ultimately dominant factor was Brit. sea-power. The problem for Germany, whose dominion now extended over most of W. Europe, was to make this *Lebensraum* stable under the constant pressure of the Brit. blockade; and if the blockade could be maintained it was evident that the Germans, during the year must attempt to break out of the encirclement, whether by invasion of G. B., by a thrust towards the Mediterranean at either end, or by an irruption still further E. than Poland. At the same time the attempt to set up a counter-blockade continued throughout the year in the Atlantic where the Ger. Admiralty hoped, by means of unrestricted submarine warfare based on the Fr. ports, to cut off G. B. from Amer. food supplies and munitions; but by this time the U.S.A. had become convinced that her own national future depended upon sustaining G. B.'s resistance to aggression. The U.S. Gov. saw that the logic of lease and lend (q.v.) required also a guarantee that the supplies could reach their destination. The weakest link in the Brit. chain of encirclement was the Mediterranean, and the contest for its control was long drawn and fluctuating. In the course of this struggle Brit. arms triumphed over the It. forces. In the course of Gen. Wavell's campaign in Libya the entire It. army in Cyrenaica was shattered, the It. Empire in E. Africa was destroyed following a simultaneous advance from the Sudan and Kenya under Gens. Cunningham and Platt, and an It. fleet, which had ventured

out to cut Brit. communications between Alexandria and Greece, was destroyed off Cape Matapan by Adm. Sir Andrew Cunningham. See ITALIAN EAST AFRICA, SECOND WORLD WAR CAMPAIGN IN (1941). The successful Brit. campaign in Libya had for the moment confirmed the grip of Brit. power over the E. Mediterranean; but it was in this region that the Germans made their first attempt to break out of their encirclement, and Brit. troops had to be diverted from Libya to meet the threat to Greece, to whom Britain had given guarantees. This Ger. thrust towards the Mediterranean was supported by other Axis activities in the Middle E.; but an apprehended Ger. advance across Asia Minor to the Caucasus was thwarted by Turkish fidelity to the Brit. alliance. See further AFRICA, NORTH, SECOND WORLD WAR CAMPAIGNS IN; GREECE, SECOND WORLD WAR CAMPAIGN IN (1941); CRETE, BATTLE OF (1941).

The outbreak of war on the E. front changed the whole aspect of affairs throughout the world. On the Axis side troops from numerous satellite countries were quickly involved in the conflict and, in response to Russian requests, G. B. declared war on those countries. The reaction in G. B. had been instantaneous. Mr. Churchill, broadcasting on the day of the Ger. invasion of Russia, unequivocally faced the simple issue that, notwithstanding differences of political creed, the enemies of Hitlerite Germany were the friends and allies of G. B. and he promised the fullest aid to Russia, though for geographical reasons Brit. assistance could only be in the form of munitions of war. Later in the year disaster came in the Far E. with Japan's entry into the war. H.M.S. *Prince of Wales* and H.M.S. *Repulse* had been sent to Singapore in anticipation of war with Japan to be the mainstay of the Brit. Pacific fleet, but soon after Japan's attack on the Allies had been launched both these capital ships were sunk. Hong Kong was taken by the new enemy by Christmas Day and Brit. Malaya was invaded. Thus 1941 ended with heavy loss in the Far E. theatre of war, and the prospect of still greater losses was to be feared before Brit. and Amer. sea-power could rally and restore the balance.

During the first six months of 1942 Parliament reflected the uneasiness of the nation at a disheartening series of military reverses and disasters. Relations between the gov. and the Commons were often much strained. On his return from Washington in Jan., following a second conference with President Roosevelt, Mr. Churchill found the Commons restive at the continued Jap. advance through Brit. Malaya, and he therefore demanded a vote of confidence, which indeed he obtained after a critical debate of three days by the crushing majority of 464 votes to 1 (Jan. 21). On result of the debate was the decision to appoint a minister of production. A further threat of political crisis, developed later after the fall of Singapore and the escape of the Ger. warships, *Scharnhorst* (q.v.), *Gneisenau* (q.v.),

and *Prince Eugen* from Brest through the Eng. Channel. Demands for a reconstruction of the War Cabinet became so insistent that Mr. Churchill yielded to the storm. The War Cabinet at the end of 1941 comprised Mr. Churchill (Prime Minister), Mr. Clement Attlee (dominions affairs and deputy Prime Minister), Sir John Anderson (lord president of the council), Mr. Herbert Morrison (home affairs and home security), Mr. Anthony Eden (foreign affairs and leader of the House of Commons), Mr. Oliver Lyttelton (production), Mr. Ernest Bevin (labour and national service), and the Australian minister Mr. R. G. Casey (minister of state in the Middle E.). The budget introduced in April was for a total expenditure of £5,286,000,000. In June Parliament approved a gov. plan for the coal industry under which, for the duration of the war, the State assumed full operational control of the mines in order to secure the maximum production, administrative responsibility being vested in a new Ministry of Fuel and Power. Mr. Churchill again visited the U.S.A. in June. In the meantime the Brit. Eighth Army (*q.v.*) was driven out of Libya, and with Rommel threatening Egypt Parliament was again anxious and critical. Mr. Churchill, for the first time, had to meet the challenge of a motion of 'no confidence' in the 'central direction of the war' in the Commons, but the vote of censure motion was defeated by 176 to 25 votes. Mr. Churchill, while admitting the seriousness of the Libyan defeat, effectively defended the central direction of the war; but he took care very soon to visit Cairo and effect a drastic reorganisation of the high command there (*see further AFRICA, NORTH*). His next review of the war situation, delivered in Sept. after his return from Egypt, gave general satisfaction to the House of Commons, and from that time relations between the House and the gov. steadily improved *pari passu* with the improved military situation; for when the king on Nov. 11 opened a new session of Parliament, Rommel was in full retreat, a large Anglo-Amer. expeditionary force had successfully landed in Fr. N. Africa, and the whole outlook in the Mediterranean had changed.

With a great army inactive in G. B., and soon swollen by thousands of troops from the U.S.A., who had been arriving in the country since the turn of the year, there had been increasing popular clamour for some more obvious exertion of Brit. military power in the European theatre of war. This clamour soon took the form of a demand for the invasion of N. Europe in order to open what was called 'a second front'—a clamour motivated by chivalrous desire to lessen the heavy burden laid on Russia, with which state a treaty of alliance in the war and of collaboration and mutual assistance thereafter was concluded in London, May 26. But the real key to the situation was the control of Africa and the Mediterranean, in which sea the devoted is. of Malta alone kept the Brit. flag flying—the one defiant symbol in what was almost a *mare clausum* of the Axis;

and therefore the Allies pursued their destined course in the Middle E. unterned by this clamour.

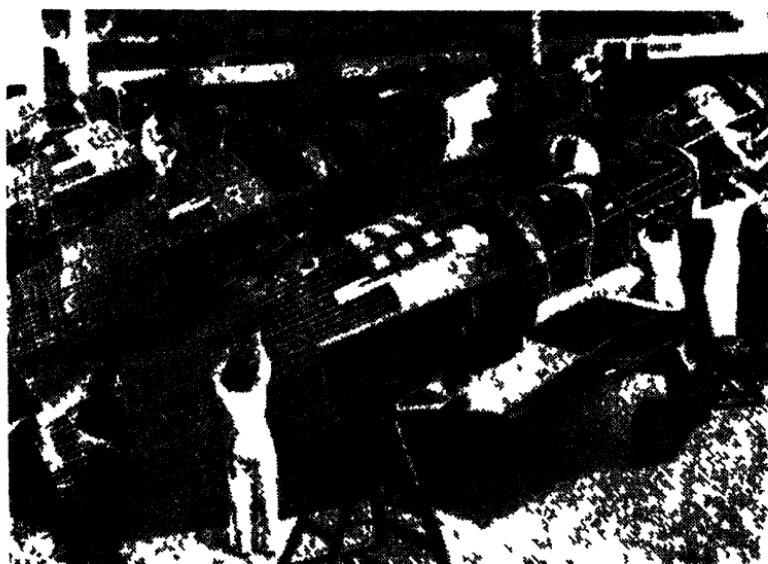
In G. B. during this year of impending great events in the military sphere, the planned mobilisation of the last reserves of man-power for the forces and of woman-power to replace the men in essential civil work, foreshadowed the deployment of the full strength of the nation in action against the enemy. But on the other hand the phase of struggle for mere survival was so far modified that already post-war reconstruction began to be discussed, and plans made for rebuilding of blitzed cities and, especially, for the use of land and the location of industry (*see under TOWN AND COUNTRY PLANNING*) and for guaranteeing social security against the fear of unemployment and want (*see The Beveridge Report*, pub. Dec. 1). The year was also notable for a further stage in the hist. of Indian autonomy. The rapid initial success of Jap. arms quickened the desire of G. B. for the removal of the political obstacles to India's war effort, and on March 11 Mr. Churchill announced that the War Cabinet had formulated a plan for the appointment after the war of an elected All India constituent assembly to draw up a constitution on dominion status lines, which plan had been taken to India by Sir Stafford Cripps for negotiation with the political parties there; but in the result the Indian Congress rejected the proposals (April 10).

During the year, although Ger. air activity over G. B. had declined greatly from the weight of the 1940 raids, the Ger., during April-May, carried out a number of rather heavy raids on the cathedral cities of Exeter, Bath, Norwich, and York (Canterbury was attacked in Oct.), doing considerable damage to life and property. The Ger. justified these attacks on cities devoid of war industries, but full of historic monuments, as a reprisal for the damage done to Lubbeck, but ignoring the military objectives in that Ger. city. G. B. was now waging more effective war against the Ger. U-boat menace. The combined effect of sea and air patrol was increased destruction of Ger. submarines operating near G. B., which sent them ever further afield in search of their victims (*see also COASTAL COMMAND*). Under the leadership of Air Marshal Sir Arthur Harris the Brit. bomber force began to strike deadly blows at the enemy's war production. Mr. Churchill promised that Ger. cities, harbours, and centres of war production would be subjected to an ordeal the like of which had never been experienced by any country in continuity, severity, and magnitude (*see further under AIR RAIDS*). At the end of the year the R.A.F. was bigger than the combined air forces of Germany and Italy; but commitments were growing even faster than the R.A.F., thereby entailing ever greater demands on production.

In 1943 Mr. Churchill, with the foreign secretary, Mr. Eden, took part in a series of international conferences

at which the allied war plans were concerted, and provision was made for continued collaboration after the war—a collaboration which, in the result, was far from whole hearted. The strain of these journeys on Mr Churchill was severe, and in fact he was seriously ill with pneumonia following the Casablanca Conference, and he suffered a second attack later in the year while in the Middle East but on both occasions made a good recovery. On May 18 after the successful issue of the Tunisian campaign Parliament formally expressed its gratitude to

insurance for all classes, for all purposes, from the cradle to the grave,' and later (Nov 9), at the Mansion House, he said the gov were formulating plans to ensure that after the war food, work, and homes were found for all. The sixth war budget made no increase in direct taxation, but indirect taxation, mainly on tobacco, liquor, and luxury goods, was increased to yield an additional annual revenue of £10 000 000. The average rate of war expenditure had risen to £15,000 000 a day and up to this time (April 12) the war had cost £B £13,000 000 000. In the



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ASSEMBLING A HAWKER HURRICANE

A painting by Elsie D. Hewlett

the Brit and allied forces for the brilliant victory in N Africa. The king visited N Africa by air on June 12 and subsequently went to Malta, on which is had been bestowed the George Cross—being everywhere received with acclamation, as indeed was Mr Churchill when he visited the island in the following Nov.

With the war progressing favourably, Parliament turned its attention increasingly to post war policies put usually in physical and social reconstruction. The gov accepted (Icb) in principle the plan for social security expounded in the Beveridge report, and in a broadcast to the nation on March 21 Mr Churchill bowed to the spirit of the times outlined a four year plan of post war social policy for execution by a national gov, representing all parties. He said that he favoured 'national compulsory

following Sept the gov introduced a scheme for collection of income tax from current earnings known as PAYE (Pay As You Earn). This scheme, as prepared by Sir Kingsley Wood chancellor of the exchequer, was at first designed to apply only to weekly wage earners but his successor, Sir John Anderson extended it to all salaried workers earning up to £600 a year and, later to the whole range of Schedule E taxpayers. The life of Parliament was prolonged by statute into the ninth year probably one reason why the Conservative party, who were well in the majority, suffered so severely a defeat in 1945—but the new session, opened on Nov 24, aroused criticism on the ground that the king's speech contained no specific promises of early legislation on such subjects as the social security plan and the

future use of land (see on this the references to the Barlow, Uthwatt, and Scott reports under TOWN AND COUNTRY PLANNING). Late in Dec. Mr. R. A. Butler, minister of education, introduced his new Education Bill, designed to supersede all previous Acts and involving a complete recasting of the national system of education (for full details see EDUCATION).

The mobilisation of Britain's manpower reached the peak this year. There were over 33,000,000 registrations of persons between the ages of fourteen and sixty-four. By the end of Sept. some 22,750,000 were in the services, civil defence, the munitions industries, or other paid occupations necessary for the civil life of the nation. In addition more than 1,000,000 women were doing voluntary work of one kind or another, while household work, including the care of 9,000,000 children under fourteen, was the prov. of most of the remainder. Also more than 1,000,000 men and women over sixty-five years of age were in full-time paid employment. A statistical analysis shows that of the 16,000,000 males between fourteen and sixty-five no fewer than 13,000,000 were in the armed forces or in paid employment which had been repeatedly combed to eliminate redundant labour. In the same age groups 7,750,000 women out of 17,000,000 were in either the auxiliary services or in paid employment. Some 700,000 women with domestic ties were engaged in part-time work. Of the single women between eighteen and forty, 91 per cent were either in the auxiliary services or in work, and 80 per cent of the married women under forty-one and without dependent children were also engaged in the war effort. These figures, as justifiably claimed by Mr. Bevin, showed that mobilisation in G. B. was more extensive and more thorough than in any other country, allied or enemy, engaged in the war. But this mobilisation involved too severe combing, notably in the coal-mines and in the cotton industry. The weakening of the labour force in the mines created so serious a problem as to necessitate the unprecedented direction of youths of eighteen to coal-mining as an alternative to military service, and indeed the blow to the industry was so serious that it was one of the factors that contributed to the economic and industrial crisis of 1946-47. For the time being, however, the remarkable war effort of G. B. was eloquently reflected in the mounting scale of the country's air and anti-submarine warfare on Germany. There was indubitably a changed feeling in Germany due partly to the ever growing R.A.F. offensive, formidably reinforced by the Amer. air forces based on Britain, and partly to the fact that, while U-boats were still taking an increasing toll of allied shipping and still increasing in number, yet the destruction of U-boats was proceeding at a still greater proportionate rate.

In a year of impressive military achievements by the allied arms, Parliament was increasingly occupied in discussing and

enacting policies for the post-war period of reconstruction. There was, however, more discussion than enactment inasmuch as the gov. pursued the method of outlining policy in white papers for parl. and press discussion before Bills were drafted. But there was one outstanding piece of legislation, namely the passing of Mr. Butler's (who became the first minister of education under the new Act) Education Act which became law on Aug. 3, 1944 (see EDUCATION). Discussions in medical circles and in the press, lay and professional, on the gov.'s white paper on a national health service continued throughout the year, while discussion on medical education was also founded on the Royal College of Physicians' report on child health and a comprehensive survey of the whole subject by the Goodenough Committee. No legislative enactment on this controversial subject, however, was destined to be passed in the lifetime of the Parliament. The white paper on medical services was followed (May) by a white paper on employment policy, in which the gov. accepted the much-quoted assumptions of the Beveridge report, but fell short of Sir Wm. Beveridge's confident exposition of 'full employment in a free society' by setting forth only the essentials of a policy for maintaining after the war 'a high rate of employment'. In Sept. the gov. announced their proposals for children's allowances, comprehensive social insurance, industrial injury insurance, and reform of public assistance. Parliament gave general approval to these proposals, and a Ministry of National Insurance was estab. under Sir Wm. Jowitt to administer the current insurance schemes and supervise the work of the Assistance Board. For housing the gov. adopted the targets of 250,000 temporary factory-made bungalows and 300,000 permanent dwellings to be erected in the first two years of peace, to be followed by 3,000,000 to 4,000,000 houses in the subsequent ten years. Parliament authorised the spending of £150,000,000 on temporary dwellings. The housing problem, however, was to prove an intractable one both as to immediate needs and long-term programmes and, as to the former, the arrival of the flying-bomb (q.v.) in the summer upset arrangements for an early resumption of building. The labour force engaged on house repairs in the London region had to be augmented from 21,000 to 132,000 men, reinforced by assistance from the Brit. and allied services. The number of houses damaged was 720,000, and of these only 280,000 had been repaired by Christmas. The Town and Country Planning Act, which gave local authorities wider powers to purchase compulsorily land required for the reconstruction of blitzed and blighted areas, became law after an acrimonious passage through Parliament (see TOWN AND COUNTRY PLANNING).

The year's budget made no important changes in taxation, but the chancellor, Sir John Anderson, announced proposals for aiding the modernisation and re-equipment of industry and agriculture

after the war by now and increased tax allowances on new buildings plant, and machinery, as well as in respect of expenditure on research. For the year ended March 31, 1944, expenditure was £5,788,421,000, being £2,749,873,000 higher than revenue and by now the national debt had risen from £8,163,000,000 in 1939 to £17,722,564,000. The great industrial effort behind the forces assured the success of the projected invasion of Normandy on D-Day, the governing date for making the utmost impact on the enemy. On that day (June 6), though the maximum mobilisation of man-power was reached the previous year, the accumulation of armed strength in men and munitions continued. On D-Day there were 4,500,000 men in the armed forces, notwithstanding the casualties in nearly five years of war, while there were now 500,000 women in the auxiliary forces. There were, at the same time, 225,000 men and 56,000 women in full-time civil defence. At the end of the year the gov. decided to increase the combatant strength of the army by 250,000 men and to enlarge the A.T.S. (q.v.) and post units of that force overseas. Comparative statistics establish in fact that at this time more than 2,000,000 women not formerly in industrial employment were mobilised in the war effort, and even this figure is a purely conservative estimate. Large redistributions of man-power became necessary through variations in the aircraft programme, the completion of special equipment for the invasion of the Continent, and for putting back into production shell factories whose output had for some time been surplus to requirements but was now necessary to meet an enormously increased expenditure of ammunition on the W. front and contingent needs in the Far E.

Up to this date more than twice the productive effort of the First World War had been absorbed by the Second World War. During the year many Home Guards (q.v.) served as anti-aircraft gun crews, but the war was now so clearly reaching a favourable climax that the Home Guard was stood down early in the winter. A gov. white paper (Nov.) on the Brit. war effort showed that Britain had mobilised 22,000,000 men and women in the active age groups for direct war service in the forces or in industry—i.e. 69 per cent. of the pop. in their age groups. G. B. itself had produced seven-tenths of the munitions supplied to the Brit. Commonwealth, other empire countries had produced another tenth, while the balance came from the U.S.A. From the beginning of the war to the end of 1943 G. B. built 6,750,000 dead-weight tons of new merchant shipping and, in agriculture, the ploughing up of 7,000,000 ac. of grassland had resulted in halving food imports. Nearly one in three of all houses in the kingdom had been destroyed or damaged, 202,000 were totally destroyed, another 235,000 rendered uninhabitable. At sea nearly 3000 Brit. ships had been sunk. Exports had been reduced to less than a third of the 1938 figure. Direct taxation

had increased from £494,000,000 in 1938 to £1,781,000,000 in 1943, indirect from £582,000,000 to £1,249,000,000. Total war expenditure had now reached the great sum of £25,000,000,000. To pay for imports of war materials the gov. had to sell oversea assets worth £1,065,000,000, while incurring fresh oversea liabilities to the amount of £2,300,000,000. The total casualties to all ranks of the armed forces of G. B. during the war were: killed, 214,723; missing, 53,039; wounded, 277,090; prisoners of war, 180,405. Total, 755,257. Civilian casualties from the beginning of the war to the end of Nov. 1943 were 58,459 killed; 81,154 injured and detained in hospital.

The ending of the war in Europe was quickly followed by the dissolution of the Coalition Gov., and the general election that came soon after resulted in the return of a Labour Gov. with a large absolute majority. This was the third Labour Gov., but the first that held both office and power. Mr. Churchill's Coalition Gov. ended on May 23, 1945, or only a fortnight after Germany's surrender; but previously both the Labour and Liberal parties had decided to withdraw from the coalition, the continuance of which they favoured till the election as against Mr. Churchill's suggestion to continue until the war against Japan had been won. The Labour party, however, believed that this suggestion was a device by the Conservative party to derive the maximum advantage from Mr. Churchill's great prestige as G. B.'s war leader through a rushed or khaki election, and their rejection of the proposal proved decisive. Mr. Churchill then resigned and formed a new gov. mostly of Conservative ministers. This 'caretaker' gov. met on May 29 and the election took place on July 5. All parties pledged themselves to the vigorous prosecution of the war against Japan and to the enactment of the great programme of social reform projected by the Coalition Gov. But in the contemplated method of achieving social reform there was a substantial difference reflecting the opposed ideologies of Conservatives and Socialists. For the Labour party put forward an industrial programme for the nationalisation of the coal, gas, and electricity industries, of inland transport services, and of the iron and steel industries. They also advocated public ownership of the Bank of England and the creation of a National Investment Board. The Conservatives stoutly opposed this domestic policy, and the electoral battle was fought mainly on this issue. The Conservatives, however, suffered one of the severest defeats in their whole hist.; for in a House of Commons of 640 members the Labour party won 393 seats as against 166 in the previous Parliament; the Conservatives dropped from 358 to only 189 seats; while the Liberal party, who had put forward 307 candidates, had only twelve elected. Mr. Churchill, having resigned again, Mr. Clement Attlee accepted the king's invitation to form a gov. In the speech from the throne at the opening of the first session, the new

gov. included in their legislative programme proposals for nationalising the coal industry, placing the Bank of England under public ownership, reorganising air transport, and for the repeal of the Trade Disputes and Trade Unions Act; and by the end of the year the Bank of England Bill had been passed and the Coal Nationalisation Bill introduced, while a scheme had been promoted for reorganising civil aviation under three statutory corporations (*see further under AVIATION, CIVIL; BANK OF ENGLAND NATIONALISATION ACT; COAL MINES, NATIONALISATION OF*). There was no equivocation in the matter of socialisation, for on Nov. 19 Mr. Herbert Morrison, leader of the House of Commons, announced that during the lifetime of the present Parliament the gov. would bring under public ownership the electricity supply industry, the gas industry, railways, canals, docks and harbour undertakings, and long-distance road haulage, while road passenger transport would be co-ordinated with the national scheme. A Conservative challenge to the whole policy of the gov. by way of a motion of censure early in Dec. served only to emphasise the strength of the Labour ministry's hold on the House of Commons.

The keynote of life in G. B. in the months following the end of the war was its austerity or poverty, and so far from bringing any mitigation, this austerity was destined to become gravely aggravated before the end of 1946, gradually rising to a crescendo of the most acute national crisis. The unforeseen hidden end of the war with Japan (Sept. 1945) enabled a somewhat greater total of releases from the forces than had been previously proposed, and by Nov. 30 955,315 men and 147,229 women were discharged to take part in the export drive for increased dollar resources. The financial stringency in Britain, which now made itself felt throughout the whole political and economic system of the country, was influenced largely by the cessation (Sept. 2) of the lend-lease arrangement immediately following the defeat of Japan. Under that arrangement G. B., having paid away her foreign investments to finance the war effort, had converted a great proportion of her industry to munitions and other war supplies, relying on America to feed the people. It was economically impossible to import and pay for the necessities of life pending the outcome of the national effort to restore the British export trade; hence it became urgent to secure a large credit in Amer. dollars to survive the period of reconstruction, and after many weeks of negotiation in Washington a loan of £1,100,000,000 was arranged, but on such onerous terms—as, for instance, Amer. insistence on the abolition by G. B. of tariff preferences—as to invite grave forebodings of default when repayment should become due.

Early in 1945 Mr. Churchill had met President Roosevelt and Marshal Stalin at Yalta in the Crimea to make plans for the final defeat, occupation, and control of Germany and for eventual co-operation for

peace (Feb. 4–11), and on Mr. Churchill's return to Britain his gov. received a vote of confidence on the Crimea decisions by 413 votes to nil. This confluence portended the defeat of Germany. Some four days after the allied forces under F.-M. Montgomery began the Rhine crossings (March 23) the 105th and last Ger. rocket to reach Britain landed at Orpington—a Parthian dart which seemed to be the prelude to a swift succession of military disasters for Germany and Japan unparalleled in the hist. of warfare. Meanwhile, however, Britain's great war leader, as has been seen, was not destined to continue at the helm after the Ger. surrender, though it may be said that he had done much to sow the seeds of Japan's defeat. While the election result in Britain was awaited Mr. Churchill went to Potsdam (July 17) (*see also POTSDAM AGREEMENT*) for a conference with President Truman and Marshal Stalin, and in the unusual circumstances he asked Mr. Attlee, as leader of the opposition, to accompany him. They left the conference to be in Britain for the declaration of the election results on July 26, and it was Mr. Attlee who returned to the conference two days later as Prime Minister with Mr. Ernest Bevin as his foreign secretary. Thus ended Mr. Churchill's premiership; but for the most part Brit. foreign policy continued unchanged throughout this and the following year.

In the first session of the new Parliament, which lasted for nearly fifteen months, the gov. enacted a great volume of reconstruction legislation besides a large instalment of their own distinctive programme of socialisation. In this session alone no fewer than eighty-four Acts were passed, outstanding social measures being the National Insurance Act, a consolidating measure providing also for an extended system of national insurance and also for the making of payments towards the cost of a national health service, and the complementary measure, the National Health Service Act, to establish a national health service for England and Wales; and the National Insurance (Industrial Injuries) Act, which repealed and replaced the former series of statutes on workmen's compensation and made new and better provision for compensation for industrial casualties. The Coal Nationalisation Act received the royal assent in July 1946 and the coal-mines were brought under the control of the National Coal Board. Imperial communications were also brought under public ownership by the Cable and Wireless Bill, as were the processes of investment by the Borrowing (Control and Guarantee) Bill. After most bitter debates in the Commons, the gov. secured the passage of a Bill to repeal the Trade Disputes and Trade Unions Act of 1927 and to restore all enactments and rules of law affected by that Act—a repeat which to many seemed calculated to bring a protracted general strike within the range of possibility. The Commons also debated a motion seeking approval of the gov.'s proposals to transfer sections of the iron and steel

industry to public ownership, but though the motion was carried by the gov.'s great majority, the weight of parl. and outside criticism of the proposals induced the gov. to postpone its Bill, though they averred their determination to carry out their plans in due course. Other Bills to receive the royal assent included the Civil Aviation Bill, to secure the development of air transport by corporations operating under public control; the New Towns Act, to provide for the creation of new towns by means of development corporations; the Atomic Energy Bill, to secure the development of nuclear energy and the control of such development; and the Trunk Roads Bill to reorganise the trunk road system. In the succeeding session projected legislation included a measure to continue conscription from the expiration of the existing scheme of national service, and also a Bill to set up a Ministry of Defence (q.v. and see also COMMITTEE OF IMPERIAL DEFENCE). Further nationalisation Bills proposed were those dealing with transport and electricity supply, and yet other Bills proposed dealt with compensation and betterment (see TOWN AND COUNTRY PLANNING), exchange control, company law (see COMPANY AND COMPANY LAW), and agric. policy.

In foreign policy it might have been supposed that the gov. would seek to assimilate its policy or harmonise it as far as possible with the ideals of Russian Communism, and indeed substantial groups of the gov.'s own supporters tabled an amendment to the royal address urging the gov. to recast their foreign policy so as to 'provide a constructive Socialist alternative to an otherwise inevitable conflict between American Capitalism and Soviet Communism in which all hope of world government would be destroyed,' and no fewer than 158 Labour members were against the gov. on this issue and abstained from voting at all, though, naturally, the Conservatives voted with the gov. so that the amendment was rejected by 353 votes to none. On the same day another Labour amendment to the address, tabled by those who opposed the introduction of conscription in peace-time, was defeated by 320 votes to 53. The Bill was eventually passed in 1947, the gov.'s critics suggesting that they had swallowed Labour's traditional hostility to conscription by calling it 'national service.' It was also in this session that the gov. introduced a Bill to terminate, after the death of the present peer and his heir, the pension of £5,000 a year paid since 1806 to the collateral descendants of Lord Nelson.

The output of the coal-mines, which the State took over at the beginning of the year (1947), fell at that time far short of requirements, with the result that industry made a bad start in a year when increased production both for domestic needs and export was essential. This set-back hastened the onset of a long-threatened economic and financial crisis. For the large Amer. loan, the use of which had for more than a year concealed the economic instability of G. B., was rapidly

being exhausted. As well as inadequate home production, two unexpected factors had aggravated the financial position: a large rise in prices in the U.S.A. and the indirect claims made on the loan by foreign holders of sterling, which by the terms of the Anglo-Amer. agreement had been made convertible into dollars. In the effort to restore the balance of trade against the time when G. B. must try to live upon its own income, austerity measures were increased, and, for the first time, bread consumption was limited by rationing; currency allowances for foreign travel were suspended; the basic petrol ration was withdrawn; and the already small supplies of newsprint further curtailed. Sir Stafford Cripps (q.v.) was appointed to the new office of minister of economic affairs, with the general responsibility of planning the augmentation and use of the national resources. Soon afterwards he succeeded Mr. Hugh Dalton as chancellor of the exchequer and thus reunited economic and financial supervision at the Treasury. His first duty in this office was to make substantial cuts in plans for capital expenditure so as to resist the inflationary pressure which was largely accountable for the maldistribution and misapplication of both labour and resources. Strained circumstances at home induced the gov., while establishing conscription (q.v.) as a permanent institution, to reduce the duration of military training below the level that the opposition thought wise and that the gov. themselves had admitted to be indispensable until a revolt of some of their supporters had made them change their minds. At the same time the fruition of long-term imperial policies, which had nothing to do with the economic emergency, conveniently tended to reduce certain Brit. overseas commitments. These were the grant of independence to India and Pakistan, of dominion status to Ceylon, and independence to Burma, in each case coupled with the constitutional right to secede from commonwealth allegiance.

Although in the field of foreign affairs—particularly over the problem of the place Germany was ultimately to take in the continental system—mutual recriminations filled the diplomatic hist. of the year, it was commonly agreed by all political parties in G. B. that the national interest was being maintained with high patriotism and ability by Mr. Bevin (see further under EUROPE, History). In domestic affairs, however, the antagonism of parties tended to become further exacerbated as the year wore on. The gov. proceeded with its programme of nationalisation, completing legislation to bring all inland transport and the electricity and gas industries under state control (see BRITISH ELECTRICITY AUTHORITY; TRANSPORT ACT, 1947). In the new session of Parliament (Oct.) the gov. ... forced their intention to extend nationalisation to the iron and steel industry and, instead, declared preventive war on the House of Lords in the shape of a Bill to amend the Parliament Act, 1911 (q.v.). It was proposed to reduce from

two years to twelve months the period during which the House of Lords might delay the enactment of a Bill which it refuses to pass. The opposition strongly resisted this Bill, which however, was read a third time in the Commons (Dec 10), on the ground that it upset the constitutional settlement of 1911 and that nothing in the conduct of the House of Lords in this Parliament justified such a limitation of powers. Among other important measures introduced in the Commons were the Local Government



B. H.

PRINCESS ELIZABETH AND PRINCE PHILIP
AFTER THEIR WEDDING, NOVEMBER 20,
1947

Bill to adjust financial relations between the Exchequer and local authorities and to relieve local rating burdens; the National Assistance Bill which finally abolished the old poor law system and completed the structure of the new social service schemes (see POOR LAW, SOCIAL INSURANCE) and the Overseas Economic Development Bill which was designed to establish and equip with borrowing powers up to £16,000,000 a Colonial Development Corporation and an Overseas Ford Corporation. Another important constructive measure substantially agreed was that for the reform of the penal law. This, the Criminal Justice Act received the royal assent the following year (1948) (see CRIMINAL LAW). It was in this year that the royal family left Portsmouth (Feb 1) for a two months' tour through the British dominions in S Africa. Princess Elizabeth came of age in April and on Nov 20, amid universal acclamation was married to Lt. Philip Mountbatten, son of Prince

Andrew of Greece, created duke of Edinburgh on his wedding day.

G B's outstanding achievement in the sphere of foreign affairs in 1948 was the consummation, through Mr. Bevin, foreign secretary, of the idea of a Western Union to counteract the 'cold war' waged by Russia against the peace of Europe. Talks were begun later between G B, France and the 'Benelux' (*q.v.*) countries to secure a voluntary association of their govs to deal with practical economic and military problems and the ultimate outcome of this diplomacy was the signing in Washington (April 5) of the N Atlantic Pact by all these countries and the U S A, together with six other nations (see further under EUROPEAN HISTORY). People in G B were always unconvinced that there would be war but for some little time in 1948 they certainly regarded the contingency as possible and saw no limit if it did happen. But they accepted the situation with a stoicism born of past lessons though the surprise and enthusiasm which characterised their attitude in 1914 and the long drawn out agony of anticipation of 1939 were now replaced in 1948 by a fatalism which however, in no way dimmed their determination.

The Parliament Bill came up for second reading in the House of Lords (Jan 27). The govt agreed to an opposition suggestion to adjourn the debate for an all party conference on the possibility of an agreed scheme of reform but the conference broke down on the question of the powers to be given to a reformed House. A motion by Lord Salterbury in the Lords for the rejection of the Bill was carried by 177 votes to 81 (June 8). The govt then decided to resort to the procedure of the Parliament Act, 1911, to carry their new Bill into law. The Bill was passed by the Commons in Sept. A Bill to nationalise the gas industry brought under state ownership more than 10,000 statutory and non-statutory gas undertakings of which about one third belonged to local authorities. Another controversial measure passed was the Representation of the People Bill which gave effect with variations to the redistribution of Parliamentary seats proposed by the Boundary Commissions (see further under ELECTORATE). The budget introduced by Sir Stafford Cripps in April was designed to produce a nominal surplus of £789,000,000 as compared with the revised nominal surplus of £636,000,000 in 1947-48. Expenditure for 1948-49 was estimated at £2,976,000,000. The budget aimed at a surplus which would more than provide for all the govt's expenditure and leave a balance to counter inflationary pressure, and it also sought to adjust taxation so as to give greater incentives to production. In the course of the year there was a rapid increase in production, coupled with the arrest of the inflationary tendency in the economy. On the overseas account the adverse balance of payments of £630,000,000 in 1947 was reduced to about £120,000,000 and in the latter half of the year achieved an overall balance

in overseas payments. But there remained a formidable deficit on dollar account of no less than £423,000,000 for the sterling area, which could only be carried with the help of the exceptional assistance G. B. had received from the U.S.A. and Canada. Taxation remained as high as ever in 1949 and was even increased in sev. directions, the chancellor admitting that it was impossible to reduce it so long as the defence and social services continued on the existing scale. The estimated surplus in the 1949–50 budget was £469,000,000. An Iron and Steel Bill introduced in the 1948–49 session of Parliament proposed to nationalise also the prin. firms engaged in the basic processes of the iron and steel industry, together with their wholly owned subsidiaries. The Bill was read a second time on Nov. 17, an opposition motion for its rejection being defeated by 373 votes to 211. On May 26, 1949, the Bill was given a second reading in the House of Lords, it being the purpose of Lord Salisbury, opposition leader, not to resist the will of the House of Commons in the closing phase of a Parliament's life, but to require that fresh sanction should be sought from the electors before even the preparatory steps towards nationalisation were taken (see further under IRON AND STEEL CORPORATION). Altered circumstances induced the gov. to increase from twelve to eighteen months the period of compulsory whole-time military service, and in the debate on the consequent National Service (Amendment) Bill a motion by Labour back-benchers was defeated by 339 votes to 51, the Bill receiving the royal assent soon afterwards. On Nov. 14, 1948, a son, Prince Charles Philip Arthur George, was born to Princess Elizabeth, Duchess of Edinburgh, being, under the Act of Settlement, 1701, second in succession to the throne. In April 1949 G. B. was a co-signatory with the U.S.A., Canada, France, and the Benelux countries of the North Atlantic Treaty, the purpose of which was mutually to guarantee each of the parties against aggression (see EUROPE, History, North Atlantic Treaty).

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Great Central Railway was estab. in 1849 as the Manchester, Sheffield, and Lincolnshire Railway. In 1897 an extension was constructed from Annesley in Nottinghamshire to Quainton Road in Buckinghamshire, which enabled the company to bring its line to London by the Metropolitan Railway. After this it was known as the Great Central Railway, with its chief London station at Marylebone. Under the Railways Act, 1921, the G.C.R., in 1923, was merged, together with seven other independent lines, in the group named the London and N.E. Railway Company. For later development see L.N.E.R.

Great Charter, The, see MAGNA CARTA.

Great Circle, or Tangent, Sailing, was known at least as early as the sixteenth century; for John Davies refers to it in his *Seaman's Secrets* (1591). A navigator who sails along the arc of a G. C. reaches his destination by the shortest route. A 'G. C.' on a sphere is one whose centre corresponds with the centre of that sphere; in the case of the earth the equator and all meridians are imaginary G. Cs. An amateur consulting the map of the world as it is erroneously represented on Mercator's projection would naturally imagine that a ship's shortest course is along the 'rhumb' line, that is, the straight line joining the two places concerned, more especially as the graph of the G. C., when plotted on such a map, must of necessity be represented by a curve. But this is not so. On Mercator's map the curve of the G. C. will always come on the polar side of the rhumb line. This explains why the curved course is really the shorter: the difference of lat. is the same for the curved and for the straight tracks, but the former, being on a higher circle of lat., has the advantage of shorter degrees of long. Thus the nearer the voyage is to the polar regions, the greater will be the difference between the tracks. As a matter of fact sailors cannot take advantage of this in the Arctic and Antarctic regions, as other conditions, such as the existence of ice, make navigation unsafe. Thus if they wish to go from Australia to the Cape of Good Hope, they must follow what is called a 'composite' G. C. in order to avoid the dangerous lats. In place of the 'vertex,' that is, the point on the G. C. track which is furthest from the equator, they must substitute the most southerly lat. they dare touch. In practice it is impossible to keep the vessel always along the G. C.: what happens is that it is steered in a series of courses, which are, roughly speaking, tangents to that circle, and it therefore follows that the greater the number of those courses, or, in other

words the shorter the tangents, the more nearly will the actual course approximate to the theoretical. Thus the ship is never headed direct for her destination till the latter is actually in sight, and traverses the meridians each time at different angles. A vessel steering a rhumb line crosses all meridians at practically the same angle. A rough means of discovering the G. C. is to stretch a piece of string tightly between the places of arrival and departure on the earth's globe, and so locate a few points on the circle; an accurate measurement involves a knowledge of spherical trigonometry.



F Fall
GREAT DANE

Great Dane, The, large dog which became popular in England about forty years ago. It is very muscular and strongly built, but its movements are easy and graceful. It is faithful and trustworthy, and when first introduced into England was a favourite companion of both ladies and gentlemen; but when the order came into force commanding all dogs to be muzzled, this hound, having a will of its own, rebelled against being held in check, and being very strong could not easily be kept under control, so had to be abandoned as a companion. It is now chiefly used as a show dog, but in the Middle Ages it was a sporting dog, and was employed to hunt the wild boar and chase the deer, being very suitable for this owing to its great activity, muscular development, and power. It has been called by various names, 'German hound,' 'Great Dane,' 'Ulmser Dog,' or 'German Dogge,' and some say it originated in Germany. In any case, it was very popular there, and Prince Bismarck had a G. D. as companion and owned specimens for sixty years. One of his hounds, Tyras, is said to have attacked the Russian Prince Minister, Gortschakoff, when he was holding a spirited conversation with his master. Tyras was slate coloured, a type very popular in Germany, but the recognised colours for the Eng. show dog are bluish-grey, red, black, pure white, or white with patches of colour. The dog has a long head, which it carries high,

broad muzzle, blunt at the point, a large nose, small eyes deeply set, and very small ears. Its neck is rather long and well arched, the legs strong and straight, terminating in large round feet. The tail is long and has a slight curl at the end, and its hair is very short. The dog should not be less than 30 in. in height, and its minimum weight should be 120 lb.

Great Dividing Range, mnt. system in Australia, which extends from N. to S. near the E. coast, then turns W., terminating a little to the E. of the W. frontier of Victoria. The highest summit is 7349 ft.

Great Driffield, mrkt. tn. of Buckrose div., E. Riding, Yorkshire, England, in the wolds, 19 m. from Scarborough. It communicates with Hull by the Driffield navigation and R. Hull. There are mills and manufs. of cotton-seed and linseed. Pop. 7200.

'**Great Eastern**', great ship planned in 1852 by Brunel and Scott Russell, and which was the largest in existence at that time. It was completed at Millwall in 1857, and was originally intended for the route to Australia round the Cape. In 1859 the ship was launched, but an explosion took place off Hastings, and a trip across the Atlantic had to be postponed. In 1860 the vessel reached New York in eleven days, and from 1860 the G. E. laid some of the telegraph cables across the Atlantic. She was broken up in 1888.

Great Eastern Railway, see under LONDON AND NORTH-EASTERN RAILWAY and RAILWAYS.

Greater Punxsutawney, bor. in the Jefferson co. of Pennsylvania, U.S.A., about 62 m. from Pittsburgh. There are flour- and silk-mills, glass and bottle factories, car works, machine shops, and iron foundries. It is the centre of a large bituminous coal and coke region. Farming and stock raising are carried on to a large extent. Pop. 9100.

Great Falls, city in the Cascade co. of Montana, U.S.A., on the Missouri R., about 10 m. from the G. F. of the Missouri, from which it derives its name. It is in the centre of a rich mining dist., and is an important shipping point for wool, livestock, and cereals. Copper-smelting is carried on. There are also railroad shops, flour-mills, and oil refineries. There are large oil wells in the dist. The Missouri R. here drops 365 ft. in 8 m.; there are three dams which provide 165,000 h.p. Pop. 29,900.

Great Farthingdon, see FARINGDON.

Great Fenton, see FENTON.

Great Fire of London, second of London's great fires, the first being in 1136 (see under LONDON, History). It occurred during the period Sept. 2-6, 1666. Starting in a bakery in Pudding Lane, in four days it devastated 400 streets and lanes, 13,200 houses, St. Paul's Cathedral, 89 par. churches, the Guildhall and other public buildings, jails, markets, and 52 halls. The area affected comprised 373 ac. within and 63 ac. without the walls, from the Tower to the Temple Church. The loss of property was

estimated at £10,730,500; 200,000 people were made homeless, but casualties were almost negligible. Pepys gives an infinitesimal description of the fire, which, on Sept. 5, he viewed from the top of Barking steeple and 'there saw the saddest sight of desolation that I ever saw: every where great fires, oyle-cellars and brimstone, and other things burning. I became afraid to stay there long, and therefore down again as fast as I could, the fire being spread as far as I could see it.' He speaks of the danger of walking in the streets 'among the hot coles'; of the glass of Mercers' chapel melted and buckled with the heat like parchment; of a 'poor cat taken out of a hole in a chimney joyning to the wall of the Exchange, with the hair all burned off the body, yet still alive'; of popular belief that the fire was due to some plot, some believing that the French had a hand in it; and of a Frenchman who confessed to starting it in a baker's shop having been 'hired for it by a Frenchman of Roane'. In a later entry he gives reasons for attributing it to the Papists, for some 'two or three hundred' ugly pugnards to stab people with [were] found in one of the houses rubbish that was burned and said to be the house of a Catholique.'

Great Fish Bay, inlet of the Atlantic in Portuguese W. Africa, 20 m. long.

Great Fish River: 1. In Cape Prov., S. Africa, rises in the Sneeuwbergen Mts., and enters the Indian Ocean after a course of 230 m. It is only navigable for small boats owing to the bar at its mouth. 2. Or Back River, 't, Canada, rises close to Lake Athabasca and flows into the Arctic Ocean. It has a wide estuary, and Montreal Is. stands at its mouth, where relics of Sir John Franklin's expedition were discovered.

Great Gable, mountainous peak of Cumberland, England, near Scafell, with an altitude of 2950 ft. The most impressive views of G. G. are to be had from Ennerdale, Borrowdale, and Wasdale. It is a favourite resort of rock climbers, the prin. pitches being Gable Crag, Kern Knotts, and the Napes Needle. From the summit of the mt. there are splendid prospects over nearly all the Lake Dist., and in one direction across the Solway Firth may be seen in clear weather Ireland and the Isle of Man. G. G. since 1923 has belonged to the nation, being the war memorial of the Fell and Rock Climbing Club.

Great Grimsby, see GRIMSBY.

'**Great Harry**', man-of-war built by Henry VII., the first of any size built in England.

Great Harwood, urb. dist. in the Darwen parl. div. of Lancashire, England, about 3 m. from Accrington. There are collieries in the vicinity, and the manuf. of cotton is carried on. Pop. 11,400.

Greathhead, James Henry (1844-96), Brit. engineer, b. at Grahamstown in Cape Colony. He migrated to England in 1859, and became a pupil of Barlow, from whom he learned the shield system of tunnelling which he made use of in the construction of the Thames Tunnel. After

this he devoted his time to the improvement of his 'shield,' and it was used in the tunnelling of the tube railway, later known as the City and S. London. He was also engaged on the Waterloo and City, and the Central London Railways.

Great Kanawha, riv. of N. Carolina, Virginia, and W. Virginia, U.S.A. Rising in the Blue Ridge, N. Carolina, in its upper course, it is called the New R. The direction of its course is generally N.W., through ranges of the Alleghanies and along valleys, having a course of over 450 m., while the area of its basin is 10,800 sq. m. It eventually enters the Ohio at Mt. Pleasant, Mason co., W. Virginia, and is navigable for about 100 m. from its mouth.

Great Kingfisher, see LAUGHING JACK ISS.

Great Lakes, The, fresh-water inland seas of Lakes Superior, Michigan, Huron, St. Clair, Erie, and Ontario, lying between Canada and the U.S.A. They are drained by the St. Lawrence, which flows into the Atlantic, and are navigable for large vessels from the head of Lake Superior to Buffalo, at the foot of Lake Erie, a distance of 1024 m. The greatest area of the lakes is 98,500 sq. m. and they contain, it is estimated, one-half of the fresh water upon the earth's surface. Their elevation varies from 600 ft. (Lake Superior) to 250 ft. in Lake Ontario. Between Lake Superior and Lake Huron is the St. Mary's R., navigable for all its length except for a distance of 1 m., during which the level drops, 22 ft. Two canals, a Canadian and a U.S., have been constructed to circumvent this obstruction, which between them give passage to a greater number of ships than does the Suez Canal. The Canadian Sault Ste.-Marie Canal is about 1½ m. in length and 150 ft. broad, and has one lock 900 ft. by 50 ft., which is emptied and filled by electric power. Lake Michigan, which lies entirely in the U.S.A., Lake Huron, Lake St. Clair, and Lake Erie are accessible to each other without the use of canals, but the last two, being very shallow, require constant dredging to keep a sufficiently deep channel open. The R. St. Clair connects Huron and St. Clair, the smallest lake, and the Detroit R. connects St. Clair to Erie. Between Lake Erie and Lake Ontario is the Niagara R., 33 m. in length, which has a drop of 326 ft. The new Welland Ship Canal (q.v.), opened for traffic in 1932, overcomes this by a series of seven locks, each with a lift of 46 ft. Each lock is 820 ft. by 80 ft. and has a depth of 30 ft. At Port Colborne, on Lake Erie, there is also a guard lock, the longest in the world, being 1380 ft. by 80 ft. The difference of level between Lake Ontario and Montreal along the St. Lawrence is overcome by a series of nine canals, with a length of 42 m. By means of these canals the whole chain of lakes, from Fort William on Superior to Kingston on Ontario, and so down the St. Lawrence to the Atlantic, is navigable to vessels of moderate draught. The lakes are ice-bound for some five months of the year, but for the remainder of the time are thronged by both freight and passenger steamers. Around Lake Michi-

gan and W. of Lake Superior are great grain-growing lands, and the grain-carrying trade on the Lakes is enormous. Both N. and S. of Lake Superior are lands rich in iron; silver, copper, zinc, and gold are also found around its shores. Lead, nickel, zinc, copper, and silver are also found to the N. of Lake Huron, and these two lakes have on their Canadian shores rich forest lands that have given rise to an enormous wood-pulp industry. Large coal-fields are found S. of Lake Erie, and on its N. and E. shores is found a natural gas used for fuel and light. The Niagara Falls, which account for much of the drop in level on the Niagara R., are a valuable source of electric power, both to the U.S.A. and to Canada, the Canadian power plant installed there having a capacity of 522,790 h.p. The lakes are rich in fish of commercial value, whitefish, trout, and herrings being caught in abundance. Pike, pickerel, bass, sturgeon, carp, perch, and eels are also found in different localities. The chief ports on the G. L. are Fort William, Port Colborne, Hamilton, Toronto, and Kingston in Canada, and Duluth, Chicago, Detroit, Cleveland, and Buffalo in the U.S.A.

Great Lever, see LI VFR.

Great Malvern, see MALVERN.

Great Marlow, see MARLOW.

Great Northern, The, company which, prior to the 1923 railway amalgamations, formed with the N.E. and N. Brit. lines the 'E. coast' express route between England and Scotland. It was started in 1846, and owed its origin to the amalgamation of the London and York and Direct N. Railways. In 1923 it was merged, together with several other independent lines, in the London and N.E. Railway group ('r.c.).

Great Northern Railway of Ireland, one of the prin. Irish railroads, including the Dublin and Belfast Junction and the Ulster Railway (one of the oldest in the Brit. Isles, opened 1839). The Dublin and Drogheda Railway was also amalgamated in 1875, four other lines being added the next year, and the whole being known as the Great N. Railway of Ireland. It is conducted by methods closely resembling those of Eng. railways. The total length is about 700 m., and like most Irish railroads it has a gauge of 5 ft. 3 in. It serves the N. half of Leinster and much of Ulster. The main lines run from Dublin to Belfast; branches connect with Londonderry and Donegal via Armagh, Enniskillen, and Omagh. There are also branches to Dundalk, Drogheda, Navan, and Oldcastle from Dublin, and to Lisburn, Killybegs, and Ballyshannon from Belfast and Donegal. The Great N. is half owner of the Co. Donegal Joint Railway. The head office is at Dublin.

Great Northern Railway Company of the U.S.A. is the most northerly of the great transcontinental routes within U.S. ter. Its E. terminus is St. Paul, which lies over 400 rail m. N.W. of Chicago. By the G.N.R. Seattle on Puget Sound is distant westward from St. Paul some 18,020 m. The total mileage worked by this great railroad is in the vicinity of

8300 m. Its freight traffic in that part of its system adjacent to the Great Lakes is very large, as this neighbourhood supports the greatest wheat traffic in the world. One of the unpleasant facts which the administrators of the great transcontinental lines in America have to face is that practically the whole directional tendency of freight traffic is to the W. seaboard, comparatively little moving in the reverse direction. The company is well and generously equipped with locomotives, passenger and freight cars. Like most of the railway companies in different parts of the world it has felt the pressure from other forms of transport during the past decade and is now directly interested in transportation by road as distinct from railroad vehicles.

Great Oasis of Egypt, see KHARGA.

Great Orme Head, limestone headland of Wales, situated on the E. side of Conway Bay, N. E. Carnarvonshire. There are interesting ruins and a 54-m. marine drive. It has a lighthouse with acetylene illumination and lenses rotated by a gas-pump; the duration of lighting is controlled by a sun-valve, and a pilot jet re-ignites the main burner at sunset.

Great Orme's Head *see* ORME'S HEAD.

Great Powers, term of somewhat vague import, connoting the leading states of the world, but when, after the battle of Waterloo, it was first used, it meant only the leading European states—Great Britain, France, Austria, and Russia—whose statesmen were responsible for the peace of 1815. After the Franco-Ger. war of 1871 Germany became one of the chief powers, and later Italy, consequent on the hegemony achieved under Garibaldi. After the advent to power of Hitler, Germany from 1933 to 1941 was the dominant voice in continental politics, while France, which under Briand had been an influential power in the League of Nations, dropped out for a time following her crushing defeat in 1940. Italy, under Mussolini, became a potent factor in the orientation of Mediterranean powers, but after her defeat in N. Africa became a mere satellite of Germany. After Itussia's defeat by Japan in 1903–4, the latter gradually became the leading power in the Far E. Almost throughout the last century, however, the U.S.A., though playing next to no part in European politics, was a potential world power. To day the leading powers are the U.S.A., Russia, Britain, and France, while in the E. China has taken the place of Japan.

Greatrakes, Valentine (c. 1629–83), 'touch doctor,' b. in co. Waterford, Ireland. He served as a soldier for some years, and was also for a time a magistrate. He believed himself to have the gift of curing the king's evil, and in 1666 pub. a brief account of himself and his cures.

Great Rift Valleys, depression stretching from Palestine to Central Africa. These rift valleys have their origin in the valleys of the Jordan and Dead Sea, extend through the Red Sea, and across Fr. Somaliland and Abyssinia to Lake Rudolph. They then divide, one branch extending in a southerly direction through

Lake Manyara, the other in a westerly direction through the Albert Nyanza, and then taking a southerly course to Lake Tanganyika. These valleys are parallel cracks in the earth's crust, and in Central Africa have walls between 4000 and 5000 ft. above sea level.

Great Salt Lake, in Utah, U.S.A., is 80 m. long and 32 m. broad, and has an area of from 2000 to 3000 sq. m. It lies 4218 ft. above sea level, and is situated in the E. part of the Great Basin near the foot of the Wasatch Mts. The lake is from 10 to 50 ft. deep, but its depth, like its area, changes greatly. It is fed by the Bear, Ogden, Weber, and Jordan R.s., all of which are too small for navigation, but the lake has no outlet. Its waters contain chloride of sodium, chloride of magnesia, and sulphate of soda to a large extent, and the lake is a popular bathing resort; indeed, owing to the greatness of the sp. gr. of the water the human body will not sink in it. The manuf. of salt is an important industry. Glauber's salt occurs in large quantities in some parts of the lake. Antelope Is., the largest is., is 18 m. long.

Great Sandy Is., see FRASER ISLAND.

Great Seal of England, see SEAL.

Great Schism, see SCHISM.

Great Slave Lake, large lake in Canada, in the N.W. Terr., about 300 m. long and 60 m. wide. It has an area of 10,000 sq. m., and forms two large bays, McLeod's Bay in the N. and Christie's Bay in the S. It is connected with Artillery Lake, Clinton-Golden Lake, and Aylmer Lake, and the Mackenzie R. flows out from it on the W. It contains trout, salmon, and other fish.

Great Southern Railway of Ireland, one of the longest railways of Ireland, 1121 m. (1913). Originally estab. in 1844 to connect Dublin and Cashel, it now serves the S. of Leinster, all Munster, and part of Connaught. Branches connect with Cork, Waterford, Limerick, and Sligo. The new G.S.R., comprising all the companies in Eire except the Great N. Railway (Ireland), came into operation in 1925.

Great War, The (First World War). For the hist. of the First World War and its causes, see WORLD WAR, FIRST; and for detailed reference to European diplomacy and policy both during and after the war, see also under EUROPE. For detailed military operations see FRANCE AND FLANDERS; FIRST WORLD WAR CAMPAIGN IN; GAJLIPOLI CAMPAIGN; ITALIAN FRONT; FIRST WORLD WAR CAMPAIGN ON; MACEDONIAN CAMPAIGN (FIRST WORLD WAR); MESOPOTAMIAN CAMPAIGN (FIRST WORLD WAR); PALESTINE CAMPAIGN (FIRST WORLD WAR); RUMANIAN FRONT, FIRST WORLD WAR CAMPAIGN ON; RUSSIAN FRONT, FIRST WORLD WAR CAMPAIGN ON; AFRICA, GERMAN EAST, CAMPAIGN IN (FIRST WORLD WAR); AFRICA, SOUTH-WEST. First World War Campaign, etc. For accounts of prin. battles and sieges see also under the various names AISNE; AMIENS; ANTWERP; ARGONNE; CAMBRAI; CATTAU, LE; KUT-AL-AMARA; SOMME; VERDUN; YPRES. For naval operations

generally *see* WORLD WAR, FIRST. Sovereignty of the Seas, and *passim*; and for accounts of prin. battles, engagements, or operations in detail, *see* DARDANELLES; CORONEL, BATTLE OF; FALKLAND ISLANDS, BATTLE OF; VINDICTIVE; ZEEBRUGGE. For peace treaty provisions, *see under* the names of the various treaties, a list of which is given under PEACE TREATIES (FIRST WORLD WAR).

Great Western Railway, one of the first built of Brit. lines, was opened from London to Bristol in 1841 at a cost of about £5,000,000. The present W. Region of Brit. Railways corresponds to the system of the former G.W.R., with headquarters at Paddington station. The system stretches from London to Bristol, goes down to Weymouth, and has a boat service to the Channel Is. It also goes to Devonshire and Cornwall, striking away to Barnstaple on the W., to Exeter and Torquay in the S., to Plymouth, Falmouth, and Penzance, and by boat to the flower growing Isles of Scilly. The great line, too, makes its way N. to Gloucester, Birmingham, Chester, Liverpool, and Manchester, and runs through S. Wales from Newport to Milford. Its broad gauge was abandoned in 1892.

Great Yarmouth, *see* YARMOUTH.

Greaves, John (1602-52), Eng. mathematician, b. in Hampshire. He was educated at Balliol College, Oxford, and in 1630 was appointed prof. of geometry in Gresham College, London. He was a great traveller, and visited Egypt in 1637 and made a very accurate survey of the Pyramids, of which he pub. a description in 1646. He also collected MSS., especially those relating to astronomy, gems, medals, and other remains of antiquity. In 1613 he was appointed to the Savilian professorship of astronomy at Oxford, but was expelled from both this and the post at Gresham College in 1618 because he was a royalist. Among his writings are *Pyramographia: or a Description of the Pyramids in Egypt* (1646) and *A Description of the Grand Signors Seraglio* (1650).

Greaves, see ARMOUR.

Grebes, diving birds (*Pygopodes*) which usually frequent rvs. and fresh-water lakes in the summer and the sea in the winter. They have broad, flat feet, and the toes are lobed and bear separate membranes which are only joined at the base. The wings are short and rounded and there is practically no tail. The legs are placed far back and the birds stand upright like the penguins. The best known Brit. species is the Little Grebe or Dabchick, which is found also in Scotland and Ireland. The Great Crested Grebe, the Red-necked Grebe, the Horned Grebe, and Black-necked Grebe are also found at definite seasons of the year. G. are useful for their plumage, but are so timid that they are extremely difficult to catch.

Grecian Architecture, *see* ARCHITECTURE, Greece.

Greece, European kingdom situated in the S. extremity of the Balkan peninsula.

The Gks. of classical times called themselves Hellenes and their country Hellas. But the appellation Hellenes, designating the inhab. of the peninsula as opposed to barbarians in general, is of a comparatively late origin. In the Homeric epos the Hellenes are a people of Phthiotis in S. Thessaly. The names Graeci and Graecia, as universal names for the people and country of G., were used only by the Romans, who extended to the whole country the name of the first tribe they encountered on the Gk. mainland—the inhab. of Dodona in Epirus. In its widest and loosest application Hellas signified in ant. times the abode of the Hellenes, and thus embraced mainland and colonies alike. More specifically, Hellas was the land which, prior to the Macedonian conquests, lay S. of the Cambunian and Ceraunian Mts., and included the following dists.: Epirus, Thessala, Acarnania, Aetolia, Doris, Locris, Phocis, Boeotia, Attica, and Megaris (in N. G.); and Corinthia, Sicyonia, Phylacia, Achaea, Elis, Messenia, Laconia, Cynuria, Argolis, and Arcadia (in S. G.). The demarcation of the frontiers of the modern state has been provocative of fierce and protracted contention. In July 1832, by the settlement concluded at Constantinople between Great Britain, France, Russia, and Turkey, the N. boundary line of G. was drawn from the gulf of Arta to the gulf of Volo. The Cyclades, the is. of Eubea, and the N. Sporades were included in the kingdom. Great Britain ceded the Ionian Is. in 1861. The proposal of the Berlin Conference in 1880 to transfer to G. Thessaly and S. Epirus was rejected by the Turks. In 1881 the boundary line was drawn from Platamonas to Mts. Kritiri and Zygros, whence it followed the R. Arta to its mouth. A slight readjustment of the boundary was effected in 1897, by which G. ceded to Turkey about 578 sq. m. of her N. frontier lands. G. in 1912 had an area of 25,223 sq. m., consisting of continental G. and the Peloponnesus, Eubea, and the Aegean Is., the Cyclades and the Sporades, and the Ionian Is. of Corfu, Zante, etc. The pop. of this area (1920) was 2,800,164. The Balkan wars, 1912-13, gave G. Macedonia, Epirus, and the Aegean Is. of Crete, Mytilene, Samos, and Chios. The area of the new ter. was 26,617 sq. m. and the pop. 2,616,813. The total area of G. is now estimated at 51,182 sq. m., of which the mainland accounts for 41,328 sq. m., and the Is. for 9854 sq. m. The total pop. according to the census of 1928 was 6,204,700. In 1938 it was estimated at 7,013,000, and on Dec. 31, 1946, at 7,450,000. The pop. of Athens is 393,000, of Salonika (renamed Thessaloniki in 1927) 237,000, and of the Piraeus 251,000. A free zone in the harbour of Salonika was in 1923 ceded to Yugoslavia for fifty years. Bulgaria was also given an outlet in the Aegean at the port of Kavala, joined to Bulgaria by a corridor under the supervision of the League of Nations. Since 1932 there has been a free zone in the tn. of Piraeus, covering 192,800 sq. yds. in land, with a frontage on the sea of

2600 yds. and nearly half a mile of railway. The areas and pop. of the geographical divs. of G. are Central G. and Eubcea, 9700 sq. m., 1,601,400; Thessaly, 5200 sq. m., 493,200; Ionian Is., 771 sq. m., 213,000; Cyclades, 1000 sq. m., 130,000; Peloponnese, 8360 sq. m., 1,045,000; Macedonia, 13,361 sq. m., 1,412,000; Epirus, 3688 sq. m., 312,600; Ægean Is., 1517 sq. m., 307,000; Crete, 3232 sq. m., 386,400; and Thrace, 3315 sq. m., 303,900.

Physical features.—The character of the Hellenic race and the influence which it has exerted on the world's hist. have been

of the ridges. The nature of the drainage system is peculiar owing to the unique character of the mt. system. The course of the rvs. is short and torrential, and only the longer streams, such as the Alpheus, Peneios, and Spercheius, possess a perennial water supply. No rv. of G. is navigable. The mts. closely hem in the lake basins, from which the waters find no outlet, except by subterranean passages. G. in her early hist. was subject to severe volcanic action, and in modern times earthquakes are frequent.

Climate.—The mts. have also important effects on the climate, tempering the



P. A. Hutton

THE THEATRE AT DELPHI, ON THE S.W. SPUR OF MOUNT PARNASSUS IN PHOCIS.

conditioned to a great extent by the geographical configuration of the land and its singular endowments. Occupying the most central position of the ant. world, G. enjoyed easy communication with the Orient and Occident. The is. of the Ægean and Ionian seas were stepping-stones to maritime enterprise. Broken by innumerable harbours, creeks, and bays, the coastline is phenomenal, its total length being out of all proportion to the area of the interior. The determining feature of the country is the mt. system. The great Pindus chain forms the backbone of N. G., and its ramifications interlace the whole area. The mts. of Morea (Peloponnesus) are an independent system, and radiate in all directions from the central plateau of Arcadia. It is the partial submergence of these mt. systems that has produced the deep indentations of the coastline of G. and the fringes of systematically grouped is. The basis of these mts. is hard limestone, hence the precision of outline and the parallelism

venement of the S. sun and aerating the country with refreshing breezes. The exceptional variety in elevation also effects rapid transitions from heat to cold. Spring in G. is a season of short duration. The Et-sian winds blow steadily in the months of early summer, but these are replaced later by the inclement blasts of the sirocco. Autumn is humid and unhealthy, and accompanied in low-lying dists. by visitations of malarial fever. Winter is crisp and temperate.

Flora.—The flora of G. is not so exuberant and varied as that of Italy and Syria. The geological structure, of which limestone and metamorphic marbles are the predominating features, is not favourable to rich vegetation. Four zones are usually recognised: (1) Below 1500 ft.: olive, cypress, myrtle, oranges, dates, almonds, figs, poplar, tobacco, cotton, pomegranates, etc.; (2) below 3500 ft. and above 1500 ft., forest zone: oak, chestnut, etc.; (3) below 5500 ft. and above 3500 ft.: the region of the beech and pine;

(4) above 5500 ft., Alpine zone: small shrubs and mosses.

Religion and Education.—By the terms of the constitution of 1864 the Gk. Orthodox Church, which has some 8,000,000 adherents was declared the religion of the State, but complete toleration and liberty of worship were guaranteed to all other sects. There were, according to the last census, 35,000 Rom. Catholics, 9000 Protestants, 126,000 Moslems, and 72,800 Jews. The gov. of the Orthodox Church is vested in a permanent council called the Holy Synod, consisting of the metropolitan of Athens and twelve metropolites, who, during their term of office, must reside at Athens.

All children between the ages of seven and twelve years must attend school, but the law is not well enforced in country dists. For higher studies there are two univs. in Athens and one at Saloniaka (Thessaloniki); the Athens Polytechnic; an agric. superior school; the School of Fine Arts; and a superior private school of political sciences. The Ministry of Education is also charged with the Service of Antiquities, managed by an archaeological council, which is responsible for the conservation and reparation of ant. monuments, the upkeep of museums, and the conduct of excavations. There is a Brit. school of archaeology in Athens, which, with the aid of gov. grants, encourages and carries out scientific research of all kinds (see also below, *Archaeology*).

Industry.—Agriculture is the staple industry of G. The chief products are wine, currants, olive oil, and tobacco. Sheep and goats are pastured in great numbers in the peninsula. Peasant proprietorship predominates. The celebrated mines at Laurion in Attica yield iron, manganese, lead, and zinc. Other mining products are magnesite, lignite, sulphur, alum, emery, and baryta. Marble is found in Paros, Attica, Thessaly, and the Cyclades.

Communications.—There are some 1990 m. of railroad, of which 823 are operated by the State. There is a ship canal (1 m. long) across the isthmus of Corinth. There was (1939) an air service, run by a Gk. company, which connected Athens with Drama via Saloniaka, and Athens and Epirus (Janinian) via Agrinion.

Defence.—Military service in the army is universal and compulsory between the ages of twenty-one and fifty-seven. The normal ann. contingent of recruits is about 50,000. In 1939 the effective strength of the army was 5000 officers and 65,000 other ranks. The Gk. Navy in 1939 comprised two cruisers, twelve destroyers, nine torpedo-boats, four minelayers, and six submarines; but there was at that date a large programme of reconstruction, which, however, was rendered negatory by the war. A Brit. mission arrived in Athens in July 1945, armed by the Gk. Gov. with full powers to reorganise the Gk. police force, gendarmerie, and prison service, free from politics.

History.—According to the Gk. historians the earliest inhab. of Hellas were the so-called Pelasgians, but the informa-

tion afforded by the ancients on the subject is scant and vague. There is mention of the name Pelasgian in Homer, but it appears to be merely a tribal name designating the inhab. of Thessaly, Epirus, and Crete. For our knowledge of the inhab. and civilisation of prehistoric G. we are therefore dependent on the more certain witness of archaeology, and in recent years Gk. archaeological evidence has been supplemented to a remarkable extent. Excavations at Knossos (Knossos) in Crete have revealed to us the civilisation of the Minoan age. This civilisation is the oldest in Gk. hist. of which we have knowledge. It flourished about 2000 B.C. Prehistoric Knossos was a city of massive structure in which the fine arts flourished, and had reached a remarkably high stage of development (specimens of Minoan pottery are of exceptional beauty and grace) and in which the art of writing was known. This last fact is of great importance, as until recently the art of writing in G. was supposed to be post-Homeric.

The next age of Gk. civilisation on which archaeology has thrown light is the Mycenaean (*A. c.* 1600-1100 B.C.), which was destined to be even greater than that of Argos in the heroic age. The Mycenaean civilisation is revealed to us by excavations on the sites of Mycenae, Tiryns, etc. The characteristic feature of these splendid cities is their massiveness and solidity. Pausanias relates that tradition attributed the building of Tiryns and Mycenae to the Cyclopes (hence the expression 'Cyclopean walls' used to denote structures of this massive type), thus testifying to the gigantic edifices of prehistoric times as contrasted with the masonry of a later date. The jewellery, pottery, and weapons excavated from these ant. cities are of rare beauty. Iron was practically unknown in the Mycenaean age. Its use is more extensive in the Homeric age, and therefore Homeric civilisation is probably post-Mycenaean. But vast invasions swept over G., and a ruder civilisation displaced this early culture.

In the latter half of the eleventh century B.C. the Dorians ravaged G. They were a coarser, harder stock than the peoples they conquered, but they brought to G. a new vigour and a new robustness, which when toned and harmonised by the finer influences of the land produced that civilisation which is the world's marvel for all time. These great migrations which swept over G. created a congestion of the pop. which was eventually relieved by widespread colonisation. The Eolian migrations estab. settlements in Lesbos, Tenos, and the Mytilene mainland. The Ionian migrations from N. Peloponnesus colonised Chios, Samos, the Cyclades, and the centre of the Lydian coast of Asia Minor. The Dorians also enlarged their frontiers and occupied Crete, Melos, Rhodes, Cos, etc. During the eighth and seventh centuries B.C. great changes took place in Gk. civilisation. Various communities became federated and some states (notably Athens and Sparta) began to exert a formidable supremacy over

their neighbours Religious union found expression in the institution of *Amplichion*, the Olympian, Nemean, and Pythian games and the pan Hellenic dictatorship of the Oracle.

Gk commerce began at this time to outrival Phoenician enterprise in maritime activity. The Corinthians were the foremost state. The Aeginetan system of weights and measures was adopted and coinage was introduced from Lydia, two epoch making innovations which are



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MICENAE THE 'TREASURY OF ATREUS'
A good example of the bee-hive tomb in an almost perfect state of preservation. The door was measured 18 ft high by 9 ft wide.

attributed to Pheidon, king of Argos (c. 668 B.C. or 718 B.C. The former date is corroborated by the record of his striking money). During this period monarchies were overthrown in most states by oligarchies, which again were displaced by tyrannies. The constitution of Sparta developed by a unique process it continued to be a monarchy, but subordinate all interests to militarism.

In the sixth century B.C. commercial and intellectual development among the Ionians reached its zenith and quickly receded. On the Gk mainland now economic evils made their appearance. The rapid development of mercantile activity caused a violent displacement of occupations, and debtors suffered enslavement. As champions of these

debtors the tyrants in most states first established their power. Thus in Athens Solon attempted to alleviate the distress of the citizens by his famous legislation (594-593), but the real object of his life-work (the confirmation of the political freedom of the Athenians) was reversed when his relative, Peisistratus (q.v.), just ruler though he was, established himself tyrant (q.v.) of Athens (561). In 514, however, Hippias and Aristogiton freed the city from tyrannical government. Cleisthenes in 507, by an equitable distribution of the people in tribes for voting purposes, paved the way for the Attic民主制 democracy. The great work of Cleisthenes was his constitution (510-508), the results of which were not to be ephemeral; they made themselves felt through the whole of the subsequent hist of Athens, and were the foundation on which all succeeding legislators built.

The fifth century B.C. was the most momentous period of Gk hist for during this period the Gk came into decisive conflict with the W. for the domination of the mediterranean world. Early in the century the Ionians revolted from the 'great king,' Darius of Persia. This ill-organized revolt resulted in the destruction of Miletus and the subjugation of the Asiatic Gks by the Persians. Athens being an Ionian city, had sent aid to her trans-Ægean kinsmen and Darius resolved to punish Gk interference and make an example of the Athenian state. The Persian Army destroyed Naucratis and Marathon, but in Attica the ill-organized hosts of barbarians were no match for the little band of finely trained Attic hoplites (heavy armed infantry) and the plain of Marathon was strown with the Persian hosts (490). The palm of victory was won for Athens by the genius of her leader Miltiades. Darius heard with consternation of the annihilation of his vast army. In the midst of his preparations for a second invasion he was cut off (490), but Xerxes, his son, mustered his hosts of soldiery from all parts of his extensive dominions and the combined force of the I. were arrayed once more against the W. The overwhelming numbers of the barbarians terrified the Thessalians, Locrians and Boeotians into offering earth and water as tokens of submission, but Athens and Sparta stood firm. A small force under Leonidas king of Sparta, was despatched to guard the pass of Thermopylae and kept the countless hosts at bay till through the treachery of the miscreant Mardonius Iphialtes, the little body of Spartans was surprised from the rear and was slaughtered to a man (480). But it was again the genius of Themistocles that saved Gk, and inspired Athens to seek her own safety and that of all Gk on the sea. In the narrow strait of Salamis the Gk fleet encountered the unwieldy ships of the Persians, and the defeat of the barbarians was so severe that Xerxes resolved to quit Gk, leaving Mardonius, his captain, to complete the campaign (480). In the spring of 479 the Persians devastated Attica and razed Athens, but suffered decisive defeat at

Platea. In the summer of the same year the united fleets of Athens and Sparta destroyed the remnant of the Asiatic fleet at Mycale near Miletus. Pausanias, the Spartan victor of Platea, at first led the combined fleets, but the honours and wealth which had fallen to him roused in him ambition. He aimed at becoming tyrant of all G., and was ready to purchase his opportunity by serving the barbarian whose armies he had routed. But the fleet mutinied and put itself at the disposition of the Athenian leaders, Aristides and Cimon, and the would-be tyrant, stripped of his power, was summoned home to stand his trial. Thus, by the sustained courage of Sparta and the altruistic intrepidity of the Athenians by land and by sea the powers of the E. were broken. In this war, as never before, G. realised her significance, and her sovereign states were forced to combine and recognise their true unity. The example of high moral calibre exhibited by the Gk. leaders during the war became a great inspiration in the art and politics of G. The Gks. having expelled the Persian invaders, freed their kinsmen across the Aegean from subjugation to Persia, and received them into alliance.

In 477 Athens formed the Dorian League, and the treasury of the armies was established in the temple of Apollo at Delos. The cities were required to furnish ships or the equivalent in money towards the maintenance of the combined fleet. The formation of this allegiance was the nucleus of the Athenian Empire. Sparta meantime still retained her position as leader of the Peloponnesian confederacy. Thus the Gk. powers, united by the common danger of the Persian invasion, became divided through antagonism of the rival confederacies for the hegemony of G. Within the city of Athens the tides of democracy were rising fast. Themistocles was the champion of this popular movement, first organised by the genius of Cleisthenes. The mantle of Cleisthenes had first fallen on the shoulders of Ephialtes, who diminished the ancient power and prestige of the Areopagus, the pillar of aristocracy (462). By the policy of Pericles this dictatorial court was robbed of all but nominal powers. By the removal of the confederate treasury to Athens and the appropriation of the funds for civic purposes, the relation of the Athenians towards their allies became avowedly autocratic. In the period 458-445 Athens was at the height of her power. There is no knowing where the extension of the Athenian power would have stopped, if the disaster of the Gk. defeat in Egypt—the massacre of Prometheus (454)—had not then intervened to weaken its growth. By the close of 452, through the mediation of Cimon, a truce for five years was made between Sparta and Athens. Freed for the moment from their quarrel with Sparta, the Athenians turned to avenge their rout in Egypt and the Phoenician fleet suffered defeat off Salamis. Cimon, however, d. before the walls of Citium and the expedition, leaderless, returned to Athens and no

further attack was made. Patriotic Boeotians now revolted against their democratic govs., which they regarded as the mere tools of Athens. The Athenians sent Tolmides, with a thousand hoplites, to support the Boeotian democrats, but he was surprised and defeated at the battle of Coronae. Next the cities of Euboea revolted, desiring to free themselves from their tribute under the Dorian confederacy. Nor was this the end of the misfortunes of Athens. The five years' truce with Sparta was expiring and ominous preparations were being made in Peloponnesus. In 468 the young king Pleistoanax and his guardian, Cleandridas, led a great force from Peloponnesus to attack Attica, but, probably through the characteristic venality of the Spartan generals, the expedition came to naught and returned to Sparta. Pericles, with fifty ships, then hastened across to Euboea, which he reconquered. This, however, was the only one of her numerous losses which Athens was destined to recover. Pericles himself shrank from the idea of continuing the contest, and negotiations with Sparta resulted in the Thirty Years peace (445) and in the same year the end of the war with Persia.

The Thirty Years peace, although it was not destined to endure for half its appointed time, gave G. some fourteen years of comparative quiet. At Athens these years coincide with the zenith of the power and influence of Pericles, who was practically the first minister of the republic for the whole period. During this period immediately before the Peloponnesian war, Athens reached the height of her literary and artistic glory. In these years were built the Propylea or entrance halls of the Acropolis and the Parthenon. In the galaxy of great names of the dramatists Aeschylus, Sophocles, Euripides, Cratinus, and Aristophanes, and the artists Pheidias and Ictinus, shine supreme. The beautiful city was a veritable haunt of the Muses.

Samos revolted in 440 over a boundary dispute with Miletus, but was subjugated in the following year and compelled, in accordance with the precedents of Naxos and Thasos, to raze her walls and give up her warships. As late as the year of this revolt, the majority of the allies of Sparta was still in favour of preserving peace with Athens, but shortly afterwards opinion began to change.

The causes which led up to this change of feeling are very various, but in the depth of his heart every Spartan felt a grudge against Athens for having built up an empire which was sufficient to overshadow the ill-defined hegemony which his own city possessed in Peloponnesus. Urged on by the Corinthians, who were envious of the commercial prosperity of Athens, and were indeed virtually at war with her, the Spartans now decided on war (432). The Peloponnesian alliance (Sparta and her allies) then sent a peremptory note to Athens demanding that Athens should 'restore their autonomy to the states of Greece.' Pericles, whose

power at this time had suffered a temporary eclipse, reasserted his mastery over the Ecclesia (assembly of the citizens), and Athens rejected the ultimatum. A few days later the actual outbreak of hostilities occurred (March 431).

The Peloponnesian war was not merely a decisive duel between two rival cities; it became a racial conflict between Ionians and Dorians, and a political conflict between democratic and oligarchic principles. It drained G. of her resources and left her weak and spiritless, an easy prey to the uncorrupted vigour of the barbarians. The war raged from 431 to 404 and ended with the destruction of Athenian power. The chief causes which brought about the final disaster were the unscrupulousness and temerity of the popular leaders, among whom Alcibiades was chief offender; the quixotic schemes of the Sicilian Empire which resulted in the destruction of the Athenian armament; and the exhausting intestine strife which reached a climax in the outrages of the Four Hundred. The final victory of Sparta was due to an ignominious and traitorous alliance with the Persian Cyrus. The destruction of the Long Walls of Athens and the surrender of her fleet (404), which only two years before had signally defeated Callanderidas at the battle of Arginuse (no fewer than seventy Peloponnesian ships being destroyed for the loss of fifteen Athenian vessels), mark the final throes of her tragic fall. And the next year, at the battle of Egospotami (405), 170 Gk. vessels fell into Lysander's hands, with 1000 prisoners, including three of the four Athenian admirals.

It was as champion of Gk. freedom against the despotic presumptions of the 'tyrant' city that Sparta had won the confidence of her allies, but when, at the close of the war, she devoted her victory to private aggrandisement, the forces of disintegration began to act. A combination was formed during the succeeding decade to lay low the power of Sparta, but the efforts of the hostile coalition were abortive, in spite of assistance from the Persians, who overthrew Spartan naval supremacy at Cnidus (394). Sparta, however, once more enlisted Persia among her supporters, and by the peace of Antalcidas became the supreme land power in G. But the price of the peace was the surrender of the cities on the Asiatic coast, nor was the hegemony of Sparta destined to survive. Thebes, under her dauntless leader Epaminondas, suddenly confronted and irreversibly destroyed the Spartan supremacy at Leuctra (371). The subversion of Sparta's ascendancy was a fatal blow to the oligarchical govs. of G., and democracies were re-established in many states. By the restoration of the Messenians Epaminondas further incapacitated Sparta. The domination of Thebes was for the moment indisputable and invincible. But the death of Epaminondas on the field of Mantinea (362) left Thebes without a leader and opened the gates for the

Macedonian invaders. Philip, king of Macedon, a barbarian, fired with the ideals of Hellenism and a staunch believer in militarism, having organised an army on a new basis of the phalanx, awaited an opportunity to interfere in the domestic variances of the rival Gk. powers. As the champion of the Delphic cause he devastated Thessaly, sacked Olynthus, and overran Phocis. Bribery here, subduing there, he gradually won over the Gk. states, and even the eloquence of Demosthenes could not arrest the victor's progress. In 338, the victory of Cheronea made Philip indisputable master of G. It is a strange irony of events that the unity of G., which Athens, Sparta, and Thebes had spilled their life-blood to create, was only realised by the sword of a semi-barbarian king, and at a time when the glory of the country's prime had irredeemably departed.

G. was exhausted as a field of military enterprise, and Alexander, son and successor of Philip, resolved to devote his indefatigable energies to the conquest of the E. Having made an example of defiant Thebes, the Macedonian turned his buck upon G. and overran the Persian Empire. He then penetrated into India, spreading effectually the language and civilisation of the Gks. over the conquered lands. His schemes were gigantic. He intended to follow the subjugation of the E. with the conquest of Italy and Carthage, but death interrupted his victorious course. He d. at Babylon in 323, aged thirty-two. No successor was found competent to shoulder the responsibilities of his vast empire, which almost immediately began to disintegrate. The Gk. states, now aware of Macedonia's weakness, made several attempts to reassert their independence. The revolt was headed by the Athenians and the Aetolians, but in 322 the insurgents sustained a decisive defeat at Crannon. Antipater, the Macedonian leader, changed the constitution of Athens to an oligarchy, and disfranchised and deported the poorer classes.

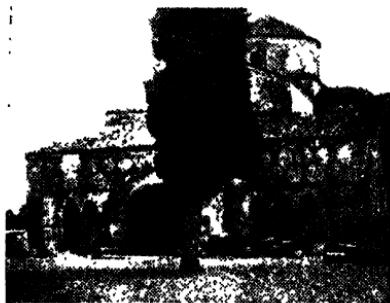
Macedonia recovered her prestige under Antigonos Gonatas, who in the Chremonidean war (266-262) once more subdued G. in spite of the formidable opposition of Athens and Sparta. The Achaean League, renewed in 231, became gradually enlarged and consolidated, its main object being the restoration of Gk. independence. Under Aratus, the celebrated Sicyonian diplomatist and irresolute general, Sicyon and Corinth were persuaded to join the league, which soon became the chief political power in G. But the league, now extending its power over Peloponnesus, came into collision with Sparta. A succession of victories by Cleomenes of Sparta prompted Aratus to invite Macedonian assistance, and thus the primary object of the combination, which aimed at replacing Macedonian ascendancy in the Peloponnesus by free democracy, was defeated. During the Social war the Achaean League was assisted by Phillip V. of Macedon against the Aetolian League; but now G. had come within the orbit of Roman expansion and

the wider interests of both parties which were at stake in the second Punic war called for a cessation of hostilities. Philip himself made a treaty with Hannibal (215). Rome in revenge sowed seeds of dissension among Philip's Gk. dependencies, and when Zama in 202 brought the second Punic war to a satisfactory close, she turned her attention to the Gk. delinquents. Philip's forces were utterly crushed by Flaminius at Cynoscephalae in 197. Peace was made on generous terms, and the freedom of the Gk. cities was proclaimed at the Isthmian games (194). At the battle of Pydna (168) Æmilius Paulus defeated Perseus, the king of Macedon, and brought the Macedonian kingdom to an end.

In 147 the Achaean League made an abortive attempt to throw off the Rom. yoke, but Metellus defeated them at Scarpea, and Mummius, his successor, made a terrible example of Corinth, dismantling her glorious edifices and transporting her priceless treasures. The Rom. administration in G. was, on the whole, tolerant and beneficial. Gk. ascendancy in thought and letters caused Rome to treat her dependency with exceptional leniency. Peace was, however, broken in 88 B.C. Mithridates, king of Pontus, incited Athens, Achaea, Boeotia, and Laconia to support him against Rome. Archelaus, Mithridates' general, was defeated by Sulla with heavy loss at Chæronea, and Orchomenos (86) and the Gk. cities which conspired against Rome were treated with extreme severity. During the civil war between Cæsar and Pompey the Athenians sided with Pompey, but when Pompey was finally vanquished, Cæsar treated his opponents with his characteristic clemency and generosity. Their gratitude was short-lived, for Athens embraced the cause of Brutus and Cassius, seeing in Cæsar's murderers champions of freedom comparable to her own heroes, Harmodius and Aristogeiton. During the struggle between Octavian and Antony, the Athenians offered their support to Antony, and consequently the victorious Octavian ruled them with a firm hand. Not till the time of Vespasian, however, did the internal administration of Athens suffer fundamentally through Rom. interference. That emperor deprived the Athenians of their gilded show of liberty and brought them under the iron rigidity of Rom. institutions and law. Hadrian, however, entertained a warm admiration and affection for the city, and made a generous attempt to restore the splendour to the citadel of the muses and to revive its literary and artistic genius.

But the work of vandalism had already begun. Incursions of the Goths swept over G., leaving destruction in their train, and the hist. of the Gk. states becomes as shifting sand. In the thirteenth century A.D. Athens fell into the hands of the E. emperor Baldwin. Subsequently it was governed by Delves of the house of Aragon, and at his death it fell into the hands of Bajazet, sultan of the Turks. It was afterwards held by the Spaniards and the

Venetians, but in 1460 the peninsula was entirely subjugated by the Turks. The Venetians invaded G. towards the close of the seventeenth century, recovered Athens, and occupied a considerable portion of the mainland and some of the ls. But the Venetian central power was not strong enough to maintain its control, and in 1718 G. passed once more under the Ottoman yoke. Peter the Great of Russia projected a campaign to free the oppressed states, but did not live to carry out his schemes. The assistance sent by the Empress Catherine was inadequate and ineffectual. The succession of Ali Pasha made the condition of the Gk. people more hopeless than before. In 1814 a society of young Gk. patriots, called the Hetaira, was formed at St. Petersburg. The objects of this society



P. A. Hulton

THE BYZANTINE CHURCH AT ORCHOMENOS (DOUDOURVANA), IN BOEOTIA

This ancient building of the convent of the Panagia, founded in 874, may occupy the site of the Temple of the Graces mentioned by Pausanias.

were ostensibly literary but were really political, and it was this society that was largely instrumental in fanning the flames of rebellion throughout G. The educated classes of Europe, nurtured in the glory of Greece, were increasingly sympathetic. In 1821 Jusuf Pasha defeated the insurgents at Falatz, and in the same year the 'sacred battalion' under the dauntless leader Jordaki was annihilated. But in the Morea the cause of freedom was attended with greater success. In Sept. 1821 a constitution was formulated by the independent party at Missolonghi, applicable to W. Hellas; later a similar constitution was drafted at Salona, embracing the E. states, and in Dec. the constitution of Peloponnesus was framed. In 1823 a final constitution comprehending the whole of G. was adopted by the National Assembly convened at Astro. But the Ottoman powers made a desperate effort to annul the decrees, and in 1825 an Egyptian army, under Ibrahim Pasha, was dispatched to the Morea. In a few months the work of the patriotic party was all but undone, and only the combined intervention of European powers rescued

the tottering standard of liberty. Ibrahim Pasha haughtily repudiated the claims of the powers, and the crisis came when, in the decisive battle of Navarino (Oct. 1827), the allies destroyed the combined Turkish and Egyptian fleets. By the protocol of 1830 G. was declared an independent kingdom and her boundaries were defined. The arrangement was in many respects unsatisfactory; it excluded Acarnania from Gk. ter. and a great part of Ætolia and Thessaly; a Turkish barrier interrupted communications between G. and the Ionian Is., while Candia, Samos, etc., were not comprehended.

The liberated state was at first governed by a national assembly, but the president, Count Capo D'Istria, assumed autocratic powers, and sedition culminated in his assassination. Subsequently the powers offered the throne of G. to Prince Leopold (afterwards king) of Belgium, but the offer was refused. The crown was then given to Otho, son of Louis I. of Bavaria. Throughout his reign discontent was rife, and an insurrection in 1842 resulted in the deposition of the king. George, second son of the king of Denmark, was then chosen king, and the Ionian Is., at that time under Brit. protection, were ceded unconditionally to the kingdom. By the Berlin Congress of 1856 G. was promised a modification of her frontier, and in 1881 a readjustment was accepted. G. acquired Thessaly, S. of the N. watershed of the Salambrus, and the tract of land bordered by the Arta R. The allocation proved distasteful to the Hellenes, who demanded Crete, and hostilities commenced with Turkey in 1897. The war was short-lived, and disastrous to the Gks., and on the intervention of the powers an armistice was concluded. By the treaty of Constantinople G. was constrained to pay an indemnity, to submit to the readjustment of her frontier, and to accept the control of the powers in financial affairs. Venizelos came to the fore with the movement in Crete to break away from Turkish rule and unite with G. In May 1910 a Cretan assembly was set up and Venizelos became president of the provisional gov. Later in the year he was elected to the Gk. Parliament, and on Oct. 10, 1910, became Premier. He set to work to form a Balkan league strong enough to withstand Turkey. A Serbo-Bulgarian treaty was followed by a Greco-Bulgarian treaty, and in the War of Liberation the strength of the league was proved by the complete collapse of the Turks (see BALKAN PENINSULA; BALKAN WARS). On May 30, 1913, Crete was ceded to G. by the treaty of London, which ended the war between Turkey and the Balkan states. When, however, the alliance was broken by the treachery of Bulgaria, G. received further extensions of ter. by the treaty of Bucharest, which ended the second Balkan war, but in its settlements ignored all ethnographic facts.

In March 1913 King George of G. had been assassinated in Salonika by a fanatic, and was succeeded by his son, Constantine XII. Venizelos endeavoured to re-

organise G. internally, but the outbreak of the First World War in 1914 proved how short-lived had been the hope of a Balkan settlement. At the beginning of the war G. maintained neutrality, since her alliance with Serbia was directed only against Bulgarian aggression. The Ger. emperor endeavoured to secure the co-operation of G., but his appeals to King Constantine as a brother-in-law and a Ger. field marshal failed to move G. from her policy of neutrality. The Gk. Premier, Venizelos, however, was for immediate intervention on the side of the Entente. The differences between King and Cabinet caused Venizelos to resign on March 6, 1915. A general election was held on June 13, and the Venizelist party won 184 seats out of 314. In Aug. Venizelos returned to power on the understanding that G. would aid Serbia against Bulgarian aggression, and G. mobilised and converted her attitude into one of armed neutrality; 150,000 allied troops were promised, but the allied force which landed in Salonika proved to be only 20,000 strong, and the Gks., feeling Venizelos had been duped, distrusted his policy. A new ministry was formed by Zaimis, and the armed neutrality was preserved. (For the campaigns in G. and Macedonia see under SALONIKA and MACEDONIAN FRONT.) But G. only maintained her neutrality with difficulty in the face of Fr. and Ger. pressure. The nation was split between Royalists and Venizelists, and towards the end of 1916 Venizelos set up a provisional gov. at Salonika and endeavoured to recruit a Gk. army to aid the Allies in the offensive which Gen. Sarrail was forced to take against the Bulgarians during Aug. In June 1917 France and Great Britain, who had guaranteed to ensure the Gk. constitution, decided to act in their capacity of 'protecting powers.' Joffre, former governor of Algeria, was dispatched to Athens to demand the abdication of Constantine. An ultimatum and a display of force secured this, and on June 12 Constantine abdicated in favour of his second son, Alexander, and quitted G. Zaimis formed a gov. at the invitation of King Alexander, while the Provisional Gov. in Salonika ceased to exist.

But Venizelos was soon recalled to power. The former supporters of Constantine were persecuted, and G. definitely entered the war on the side of the Entente. By the treaty of Sévres (Aug. 10, 1920) G. was awarded practically all Thraco outside Constantinople and a mandate over Smyrna and the hinterland. On Oct. 25, 1920, Alexander d. from the bite of a monkey, and the elections in the following month, on Nov. 14, resolved themselves into a struggle between the Venizelists and the Constantiniots. Venizelos was defeated and left G. Rhassis became Premier, and a plebiscite favoured the return of Constantine. The result was that in the war between G. and Turkey over the possession of Smyrna (see GRECO-TURKISH WAR), G. was deserted by the powers, France favouring the Turks. G. was forbidden to attack Constantinople,

and on Sept. 22, 1922, the Turks captured Smyrna. This was followed by the second abdication of Constantine, who retired to Palermo and d. in the following year. The generals Gonatas and Pangalos became premier and minister of war respectively in a 'revolutionary gov.' Their chief act—the execution of Iiadjanestes, former commander of the forces in Asia Minor, together with five ex-ministers—brought G. into disgrace.

By the treaty of Lausanne, July 14, 1923, G. lost E. Thrace, the boundary between G. and Turkey being fixed at the Maritza R. Shortly after, on Aug. 27, G. was embroiled with Italy over the murder of Gen. Tellini, It. delegate, with the other members of the commission investigating the Albanian boundary, while on Gk. soil. Following an It. ultimatum Corfu was bombarded, and although the Its. were forced by the League of Nations to evacuate Corfu on Sept. 27, G. paid a large indemnity. An unsuccessful counter-revolution against the 'revolutionary gov.' brought the monarchy into discredit, and King George was asked to leave for Rumania. On March 25, 1924, G. was proclaimed a republic, although the king was allowed to retain his title. Later a coalition gov. was set up, with Zalmis as Premier, and on June 2, 1926, after three years of discussion, the constitution was passed.

The republic endured with varying fortunes until 1935, when, following a plebiscite organised by Gen. Kondylis, the monarchy was restored by an overwhelming popular mandate and George II. was recalled to the throne. Prior to these events Venizelos, returned to power in 1928, sought an entente with both Italy and Turkey, but the interests of those two countries were too conflicting to allow of any rapprochement between them and G., and, after trying vainly to secure the passing of certain anti-Royalist measures, Venizelos resigned in 1932. Zalmis, who had been elected president in 1929, now summoned the Royalist, Tsaldaris, to form a gov. from the Populist party. Later the Venizelists, led by Gen. Plastiras, tried by a coup d'état to forestall the restoration of the king, but the rising was short-lived, and both Plastiras and Venizelos fled the country. The king, whose restoration was due so much to any access of enthusiasm for the monarchy as to the hope that it might end a decade of unsuccessful democratic experiments, insisted, in the interests of national unity, on a general amnesty and a general election. Kondylis, however, demanded the exclusion of Venizelos, but, strangely enough, these mutual rivalries were fortuitously extinguished by the death in 1936 of Venizelos, Kondylis, and Tsaldaris, and Gen. Metaxas became Premier. In the following year Prince Paul, brother of the king and heir presumptive, was married to the Princess Frederika, daughter of the duke of Brunswick and grand-daughter of the ex-Kaiser, a marriage which was not destined to have any effect on Greco-Ger. relations. In this year the 150th anniversary of the birth

of Byron was celebrated in G., the Brit. poet's personality being as greatly revered to-day as when he d. fighting at Missolonghi in the cause of Gk. independence. On the pretext of a Communist revolt Metaxas now set up a virtual dictatorship, Parliament being dissolved and political parties being suppressed, and in 1938 he was made Premier for life. A treaty was signed (April) with Turkey to subsist for ten years, under which each country undertook to remain neutral if one of them were attacked, while each would prevent the transport of troops or munitions through its ter. to any state attacking either of them. At the same time Gk. and Turkish troops entered the Thracian frontier ter., which for fifteen years had been demilitarised under the treaty of Lausanne (q.v.).

In 1939, when Germany was menacing the whole of Europe, Chamberlain, the Brit. Prime Minister, announced that in the event of any action threatening the independence of G. the Brit. Gov. would at once lend the Gk. Gov. all the support in their power—a guarantee which was the more readily given on account of the importance of the Gk. naval bases in the E. Mediterranean. After the outbreak of the Second World War a declaration of friendship between Italy and G. was pub. in Rome (Sept.)—a peculiarly hypocritical move on the part of Mussolini, especially as it was reaffirmed later in the year, though it is to be admitted that its *raison d'être* lay in the suspicions of the Gk. people of Italy's intentions. These suspicions were fully confirmed on Oct. 28, 1940, when Mussolini, evidently confident that the It. army under Graziani, based in Libya, could advance at leisure to the invasion of Egypt, suddenly launched a treacherous attack without a declaration of war across the Albanian frontier into G. He seems to have acted against the advice of his general staff who were naturally averse from risking warfare on two fronts, and to have expected little or no resistance. But when the small Gk. Army proceeded to defend its ter. with sublime courage and tenacity, the world was amazed to see the It. forces hurled back in full retreat. As far back as the previous Aug. It. propagandists had accused G. of breaches of neutrality and of ill treating the Albanian minority in Epirus—the familiar technique employed by the dictators when contemplating an attack. On Aug. 15 an It. submarine had torpedoed and sunk a Gk. cruiser, which had been sent to Tinos for the feast of the Assumption. The Gk. Gov. made every effort to avoid a breach, while taking precautionary measures on the Albanian frontier. When, on Oct. 28, Metaxas refused to cede strategic bases in G., seven It. divs. came into action even before the expiration of the ultimatum demanding the bases. Mussolini expected either surrender or a merely nominal resistance, but he found the country united and the Gk. Army full of patriotic fervour. A small contingent of the Brit. R.A.F. had been sent to co-operate with the Gk. defence and, on Nov. 11, while the Its.

were still being pressed steadily back through the Albanian mts., the Fleet Air Arm delivered a crippling blow at the main It. fleet lying in Taranto harbour, thereby reversing the balance of naval power in the E. Mediterranean. The Brit. Gov.'s air and naval assistance had been sent to the Gks. within three days of the It. attack, and the result was that Mussolini found that he had presented the Brit. forces with an opportunity of striking at the It. Fleet from Gk. bases. In the central sector the Gks. practically annihilated an It. div. of Alpini, which had rashly ventured into the wilderness of the N. Pindus. In the N. or Macedonian sector, where the Its. had remained more or less on the defensive, the Gks., quickly realising the truth of the military maxim that he who fails to attack is already half beaten, launched a strong assault towards Koritza. In the S. or coast zone, the only place where the It. penetration into Gk. ter. had been deep, the Its. hastily retreated over the Kalamos R. Under the supreme command of Gen. Papagos the Gk. Army displayed brilliant tactical skill in int. warfare, turning one position after another by seizing points of vantage which dominated it. They took Koritza on Nov. 22, cut off the port of Vanti Quaranto on Dec. 6, and, two days later, marched into the strategically important tn. of Argyrokastro. By the end of the year they had conquered nearly one-third of Albania and were approaching Tepelini.

Heavy reinforcements, however, were now reaching the It. armies and for two months the position remained essentially unchanged. In March 1941 the Its. launched a desperate offensive against the Gk. lines, yet no part of the defence yielded ground, and it can hardly be doubted that if the Gks. had had no other foe than the Its., they would have successfully defended their independence; for what they lacked in naval and air power was supplied by the co-operation of Brit. naval and air forces. But in April the Ger. armies crossed the Bulgarian frontier into Macedonia, and though a gallant stand was made by the Gk. forces, aided by a Brit. expeditionary force of some 60,000 men, the odds, both military and political, were so overwhelming that in a few weeks the whole of G. was in Ger. hands and the Brit. forces had been evacuated. (For details of the campaigns see GREECE, SECOND WORLD WAR, CAMPAIGN IN (1941).) The spirit of the Gk. people rose to incredible heights of courage and self-sacrifice in their struggle against Italy and when the Gers. attacked they did not falter. But owing to internal dissension, the Gk. Gov. was by no means steadfast, and certainly deteriorated after the death of Gen. Metaxas (Jan. 29, 1941). The war effort was always hindered by jealousies and suspicions, which caused Venizelist officers above the rank of captain to be excluded from the army, besides sowing doubt among the educated classes generally. There were sev. quislings in the Cabinet and many prov. governors and officials were pro-Ger. But the Gk. people remained lion-hearted

to the end. From the moment when Yugoslav resistance collapsed the Gk. Gov. seemed to resign itself to defeat. In mid April a depressing report of the military situation given to the Cabinet by Gen. Papagos caused the Premier, Korizis, to commit suicide. Such was the mood to which some of the leaders of the nation had fallen victims. Even when all was lost the Gk. people never wavered in their attitude towards their Brit. allies. The inhab. of little tns. and ports worked with a will to assist the evacuation of the last parties of Brit. forces, while on land the utmost hospitality was shown to stragglers.

King George and his ministers withdrew to Egypt and finally reached England in Sept. Ger. forces entered Athens on April 27 and set up a puppet gov. under Gen. Tsolakoglu. Thereafter ensued a period of dire privation for the cap. and for the whole country. Crops and stores of foodstuffs were requisitioned by the Gers., who issued occupation paper money to the amount of 1,000,000,000 marks to enable their troops to observe the formality of payment. Despite arrangements made by the Allies to get food into G. people were now dying of starvation to the number of 600 a day. It. troops entered Athens on June 25 and formally took over the occupation of the country from the Ger. garrison; but the Gers. continued to control all communications, the coastline, and the aerodromes, besides being in control of Crete. At the end of the first fifteen months of the Axis occupation of G. some 100,000 of a pop. of 1,000,000 in Athens and the Piraeus had perished. Guerrilla warfare was waged incessantly throughout 1942, particularly in Macedonia. Other groups operated in the Peloponnese, among them being a number of Brit. soldiers, while in Crete Brit. troops who had not been able to escape were co-operating with the Gk. resistance movement. Sabotage against Axis troops on railways and supply stores was rife despite reprisals. An agreement between Great Britain and the exiled Gk. Gov. was signed on March 1 respecting the organisation and employment of Gk. armed forces, and the two govs. agreed that among the objects of the war were the 'complete liberation of Greece and the re-establishment of her freedom and independence.' Lend-lease agreements were also made between Britain and (i., and between America and G. But the following year saw the tragedy of the enemy occupation, with its incidents of famine, oppression, and reprisals, aggravated by the miseries of a people divided against itself.

In the guerrilla warfare differences of political opinion began to undermine the unity of purpose of the various bands. During the iron rule of Metaxas the old cleavage of the people into Monarchists and Republicans . . . due to the influence of Venizelos (q.v.), had tended to weaken with the restoration of the monarchy; but when the king left (i. again, though under force of circumstances, the old animosities were revived against him for having

kept Metaxas in office. The king tried to smooth over differences by issuing declarations promising, when he should return, to consult the will of the people on the political and constitutional status of the country. An attempt to counteract the effects of this strife among the 'Antartes' (irregular bands) on their resistance to the Axis invaders was made by the introduction of Brit. liaison officers into G., and on July 2, 1943, it was announced in Cairo, whither the king had now repaired, that the Gk. guerrilla bands had come under the supreme allied command in the Middle E.; but there none the less remained in the Antartes no fewer than five separate organisations, the chief being E.L.A.S. (National Popular Liberation Army) with a strong Communist element; the E.D.E.S. (National Democratic Gk. Army); E.A.M. (National Liberation Front); and all acting in co-operation with the general headquarters in Cairo or purporting to do so. Yet in spite of these feuds between the bands of the Antartes the guerrilla struggle against the Axis forces was maintained throughout the year, with the bands in virtual control of the region lying between Thessaly, Macedonia, and Epirus. Fighting reached a peak shortly before the allied invasion of Sicily, when the Gers., believing an allied invasion of G. to be imminent, dispatched four divs. to G. With the collapse of Italy the Gers. revoked the div. of G. into Ger. and It. zones of occupation and resumed control of all communications. On June 24, 1944, the R.A.F. made its first major attack on the Gk. mainland since the evacuation of Crete, the attack being on airfields at Salonika; while the Ainters. bombed an aerodrome near Athens and industrial targets. The differences of political opinion, which early in 1943 had led to armed strife between rival bands of guerrillas, were continued into 1944, but during Feb. Brit. liaison officers succeeded in getting their avowed representatives to agree to end hostilities and co-operate in the fight against the Gers. Yet the unrest in the Gk. forces remained and there were mutinies in both the army and navy based in Egypt. Papandreou, leader of the Republican Socialist party, escaped at this time from G. and went to Cairo to urge the cause of national unity. He received from Mr. Churchill a promise of support in his task of directing all Gk. forces against the Gers. A conference in the Lebanon (May) of various Gk. political parties resulted in an agreement or National Charter, but it was not clear how far the delegates could claim to represent their sev. groups. In June the king entrusted Papandreou with the formation of a gov. of national unity, but in the following month the parties drifted further apart. By Oct. the S. areas of G. were nearly free of Gers., although in the N. fighting was still going on between the national bands. On Oct. 14 Athens and the Piraeus were occupied by Brit. troops, and on Christmas Day Churchill, accompanied by Anthony Eden, flew to Athens to try to compose Gk. differences and end the fratricidal strife.

By now the Gk. National Gov.'s control inside G. was exercised only through E.A.M. and its E.L.A.S. army and in the Pindus region by the E.D.E.S. force, and in any case was sporadic. Though G. had now been liberated and national belligerent resistance was no longer necessary, resistance had resulted in the grouping of a great many parties—before the time of Metaxas there had been literally scores of amateur political groups—into E.A.M. and that party now remained united as the largest political party. Decisively left wing, it comprised the Communists, the Socialists, the Union of Popular Democrats, the Agrarians, and many others. The fact that E.A.M. was openly against the king's return was responsible for a wave of monarchist feeling among the nationalists or right-wing elements, and E.A.M., favouring a republican form of gov., now pressed for an immediate vote so as to ensure a decision while its armed forces were in existence. On his return to Athens Papandreou enjoyed the undoubted support of the mass of the people, and he clearly sought to form a gov. really representative of most shades of opinion. But armed terrorism stalked through the land, the forces of E.L.A.S. and E.D.E.S. being responsible. The gov., with the support of Lt.-Gen. Sir Robert Scobie, commander-in-chief of the Gk. Army, announced their determination to disband these forces by Dec. 10 and to re-form the Gk. Army to supersede the resistance groups as the regular armed force of the nation. During Churchill's visit there was a demand for a regency under Archbishop Damaskinos (*q.v.*), and the Brit. Prime Minister asked the archbishop to convene a conference of all parties to test this demand. Churchill having secured the consent of the absent king, Archbishop Damaskinos on Dec. 31 was invested with the royal power pending his regency. Additional Brit. troops were now sent to Athens and street by street the cap. was cleared. The assailants fled, and a truce was signed, though it was evident that the existing authorities in Athens would never work as colleagues with the Communist leaders who had assailed the city and brought so much misery on G. When the truce was signed E.L.A.S. had lost half its strength of 25,000 men. It was averred on good authority that they had played next to no part in resistance to the Gers., being intent mainly on the liquidation of their political opponents. The peace agreement was signed on Feb. 12, 1945. One of its clauses was that a plebiscite should be held to decide finally on the constitutional question, under the supervision of the Allies. But this agreement did not bring political harmony. E.A.M. complained that the entire state machinery was manipulated by Fascists and that the whole resistance movement was being ruthlessly persecuted, while the Communists levelled their attacks against the presence of Brit. troops in G. No fewer than six Cabinets held office during 1945. In Oct. to end the deadlock, the regent,

Damaskinos, himself assumed the office of Premier, but handed over the government to Kanellopoulos, who in his turn gave way to Sounoulis, the eighty-six-year-old leader of the 'Liberal' party. The majority of the ministers in this Cabinet, which included Tsoudros, head of the Gk. Gov. in exile from 1941 to 1945, as vice-premier, were old Venizelists. The apparent hopelessness of the political situation had led the archbishop to announce his impending resignation of the regency, but on the appeal of the Brit. and Amer. Govs. and of the new Gk. Gov. he withdrew his resignation (Nov.).

In 1946 in some areas, especially in the N., armed bands continued their activities despite the truce. The Gk. Gov. represented to the Security Council of United Nations their view that these guerrilla forces were supported by G.'s N. neighbours or, in plain language, Russian Communist influence. Probably K.K.M., or the Gk. Communist party, were behind this movement; for their hatred of the W. powers and their attachment to Soviet Russia and to Marxist principles remain undeniable, and they lent themselves readily to foreign exploitation. There were elections in March 1946, but the govs. which resulted from them failed to produce a constructive and economic policy. The explanation of the unhappy state of G. is not far to seek: there was too much confidence in the possibility of solving by force problems which sprang from five years of dictatorship, then four years of Ger. occupation, then a resistance movement in which the people participated as a whole, and lastly a revolution. Gradually, however, in 1946, the Royalist Gks. succeeded in gaining control of the stop-gap gov. and eventually a new plebiscite once again resulted in a majority in favour of the return of the king (see GEORGE II), who soon afterwards left England for Athens. The Brit. Labour Gov. in 1947, decided that its financial commitments to G. must end after March 31 and further that the Brit. troops would be reduced and eventually withdrawn, and they so informed the United States Gov. President Truman then asked Congress for authority to give immediate economic and financial aid to both G. and Turkey, on the ground that the foreign policy and national security of the U.S.A. were involved, and that the United Nations and its related organisations were not in a position to extend help of the kind that was required. What President Truman plainly saw was that the Gk. Gov. was unable, with its weak army, to cope with the terrorist activities of thousands of armed men who defied the gov.'s authority at various points, particularly along the N. boundaries. Britain, in the throes of an industrial and economic crisis, could no longer sustain the burden of garrisoning and supplying the needs of G., especially as the functions of U.N.R.R.A. were then ending. 'The world is not static,' said President Truman, 'and the *status quo* is not sacred, but we cannot allow changes in the *status quo* in violation of the

Charter of the United Nations by such methods as coercion, or by such subterfuges as political infiltration—a palpable hint to Soviet Russia, which was seeking to control all other states on her W. border, and even in mid Europe.

In the midst of these preoccupations the king d. suddenly (April 1) of a heart attack and was succeeded by his brother, Prince Paul. Civil war prevailed in G. throughout the next two years or more. Early in 1947 the U.S. Gov. secured the passage of the Gk.-Turkish Bill, the pub. documents relating to which measure indicated the necessity and urgency especially of Amer. aid to G. The U.S. Gov. stated that G. was on the verge of financial collapse; that the Gk. Communist party was determined to impose a Communist regime on the country regardless of the will of the majority and at any cost in suffering; that Russia was giving moral support to the opposition elements in G., and that in view of the extreme weakness of the Gk. Army it was certain that the three N. neighbours of G. could with little difficulty seize a portion of Gk. ter. if they were not deterred by fear of international complications and by the fact of the presence in G. of Brit. troops, whose small numbers, however, precluded them from exercising more than a political and psychological influence. Apart from receiving over £100,000,000 worth of supplies from U.N.R.R.A., the Gk. Gov. had substantial military aid from Britain and the U.S.A. Most of the £132,000,000 advanced by Britain up to May 1947 was spent on military stores, while over half of the credit of £71,000,000 advanced by the U.S.A. went the same way. Nevertheless the year 1947 saw a steady extension of the area of guerrilla fighting, and this caused the U.S. Gov. to establish in Athens an Amer. military staff, representing all three services, and to appoint military advisers to all the larger units in the field. Both moral and material aid, however, continued to reach the forces of the Communist leader, Gen. Markos, from the N. neighbours of G.; while the guerrilla leaders greatly improved upon the political tactics of the E.A.M. and the E.L.A.S. movement of armed resistance during the world war years, combining with these equally improved military tactics. Thus reinforced Markos strengthened his hold on the mountainous country of Epirus, Thessaly, and W. Macedonia, and secured the formation of political organisations in ter. so 'liberated.' Where E.A.M. never succeeded in unifying the political and military leadership of the wartime resistance, Gen. Markos and his fellow Communists had some success in bringing the two together. The fighting of spring and summer (1947) having left the rebel forces intact, they began the intensive organisation of the areas they had acquired since the previous year. At the end of 1947 the Gk. Parliament banned strikes for the duration of the civil war. On Dec. 24 Gen. Markos issued a proclamation announcing that he had set up a 'free Gk. gov.', the members of which were, of course, drawn entirely from the Gk.

Communist party. The following day numerous arrests were made by the Gk. Gov. in Athens. The rebels continued with an all-out offensive against Koritza and the adjoining ter. to establish there their new 'free gov.' but on Dec. 31 Gk. troops relieved Koritza and the rebels withdrew. On Jan. 7 Britain warned the Yugoslav and Bulgarian Govs. against recognition of the Gk. rebels.

The inability of the Gk. Gov. throughout 1948 to win a decisive victory over the rebels or to control rising prices, or to carry out administrative reforms, much dimin-

mittee found that the Gk. guerrillas had received aid from Albania, Bulgaria, and Yugoslavia. The rebellion in G. was to some extent interwoven with a long continuing dispute of a quasi-irredentist character, between G. on the one side and Yugoslavia, Bulgaria, and Albania on the other. But even if it were possible to satisfy Gk. claims on Albania in the Epirus and Bulgaria's wish for an outlet to the Aegean, there remained Russia's strategic aim of a Communist G. which was, and is, echoed in a minor key by Yugoslavia's desire for an 'independent'



Camera Press

THE GUERRILLA WAR, 1947
King Paul of Greece inspects a frontier post in Northern Greece.

ished hopes of the country emerging from its tragic plight. The rebels were now active everywhere and dominated wide areas of Thessaly and the Peloponnesus. In these circumstances the Coalition Gov. of Populists and Liberals under Sophoulis imposed martial law over the whole country, a desperate move which promised little relief in face of the added complication of conflict between the chief political parties. The Liberal party under Sophocles Venizelos succeeded in Oct. 1948, their chief motive being that they were deprived of their share in the gov., coupled with their belief, unsupported by any rational argument, that they could govern better than those who were in office. But the truth was that there could be no solution either to G.'s political or economic troubles without there being an end to the civil war. The Dodecanese Is. had been officially incorporated into the Gk. kingdom on March 7, 1948, and in Aug. a United Nations com-

Macedonia, together with the port of Salomik.

In Nov. the General Assembly of the United Nations resolved, by forty-eight votes to six, that the support given to the Gk. rebels by Albania, Bulgaria, and Yugoslavia 'endangers peace in the Balkans and is inconsistent with the purposes and principles of the charter.' A last effort at peaceful settlement failed when negotiations were broken off by the Communist states on the pretext that G. had refused to renounce her claims to N. Epirus. The rebels in the meantime were steadily gaining ground, and continued to be supplied with arms and provided with safe retreats by these states; Yugoslav intervention, however, declined after Tito's expulsion from the Cominform.

Greek Law.—The first written laws in G. did not appear until the development of the Gk. city states; previously the only existing laws had been a floating body of unwritten 'customary' laws. But by the

beginning of the sixth century B.C. every first-class Gk. state, except Sparta, had advanced beyond the stage of unwritten usage.

Owing to the peculiar geographical conformation of the country, Gk. law tended to develop along separate lines in the various states. Consequently there was at no time a common law for G. comparable to the common law of England. Although there were many principles common to all the various codes, such as the marriage law and some provisions in the criminal law, their presence is to be attributed to the common stock of anct. Gk. ideas from which all Gk. laws are derived. The Athenian judicial system, as developed under the democracy of the fifth and fourth centuries B.C., stands inevitably in the forefront of Gk. law, both because of its high degree of development and the influence it exerted over the whole of the Gk. world through the cultural and political supremacy of Athens. It was Dracon (c. 620 B.C.) who first codified the mass of unwritten laws into what was intended to be a permanent body of law; but the real basis of Athenian law was laid by Solon, during his archonship in 594 B.C. The code of Solon may be said also to have laid the foundations of Athenian democracy by the formulation of the *isonomia*—equal membership of Assembly and supreme Law Court for all free-born adult males born in Attica. The Peisistratid tyrants preserved the code almost intact, but after their final expulsion Cleisthenes revised it once more, giving it a still further bias towards democracy.

Two main principles govern the complicated structure of Athenian law, both constitutional and civil: first, that all law should be easily intelligible to the ordinary man, and, secondly, that the best guarantee of a pure administration of justice is the common sense and moral instinct of large bodies of ordinary men. For this reason the *dikastai* or jurymen occupy the most prominent place in the Athenian judicial system. Drawn from the ordinary citizens over thirty years of age not under any civil disqualification, these courts of *dikasts*, sometimes reaching 6000 in number, formed both judge and jury; they controlled the appointment and conduct of executions and eventually encroached even upon the sovereign Assembly. Athenian lawsuits fall generally under the headings of *graphai* (public suits) and *dikai* (private suits). These were always initiated by a private individual, the *dikasterion's* function being the purely passive act of judging; it was possible, however, to counter-accuse the accuser who brought an illegal action and to penalise him heavily. The Athenian usually conducted his defence in person; many, however, enlisted the services of a Demosthenes or an Isocrates to compose their speeches for them, and many such speeches are still extant. Athenian justice, like other Athenian institutions, soon became decadent; appeals to the emotions of the jury had

always been a weakness of the system, and corruption and the practice of paying the jury for their services further degraded the Athenian law courts. With the Rom. conquest the Rom. system of law gradually took the place of the Gk. system, which can now only be disinterred with difficulty from extant speeches and inscriptions.

Greek Language.—The anct. Gk. language belongs to the Indo-European group, and was traditionally divided into the four dialects, Aeolic, Doric, Ionic, and Attic, roughly in accordance with the different branches of the Hellenic race. Aeolic, the dialect of Lebos, Boeotia, and N. Thessaly, has no great literary importance save as the language in which Sappho and Alceaus wrote. Doric, spoken by the natives of the Peloponnesus, Locris, Phocis, and the Dorian colonies and is. in the E. and W. Mediterranean, is particularly characterised by the broad 'a' (for 'η') and by a peculiar system of accentuation. It is the dialect of the Gk. choral poetry in general, and is found in the choruses of the Attic tragic writers, as well as in the Sicilian elegies of Theocritus. Ionic, with its sub-dialect epic, was the language of the earliest extant Gk. writers, historians like Herodotus and Herodotus, the Ionian philosophers, most of the elegiac writers, and above all Homer and the other epic poets. The language of Apollonius Rhodius and other later epic poets is only a scholarly, and sometimes inaccurate, imitation of the original epic sub-dialect. Attic is sometimes regarded as a sub-dialect of the Ionic, with which it agrees in its having 'η' for long 'α' and in contracting :: into :: and οι into ου. The digamma Φ ('v') has been dropped, as it has, except for the purpose of scansion, in Ionic. As the language of the great Athenian writers, Attic naturally came to supersede all other dialects as the standard of correct classical Gk., through the spreading of Attician cultural and commercial supremacy throughout the Gk. world. It is the basis of the modern Gk. language. Gk., in its various dialects, had already penetrated to Sicily, S. Italy, France, the Sp. coast, and all round the E. Mediterranean, when the conquests of Alexander the Great made it the universal lingua franca, not only of Asia Minor, but of a good part of the Near E. With the Rom. conquest of the Mediterranean basin the language spread still further, and became the recognised medium of polite intercourse in the Rom. world, much as Fr. was to become later in diplomatic and social circles. When the W. Rom. Empire was submerged beneath the barbarian invasions of the fifth century A.D. Gk. disappeared from the W. world for a thousand years, but lived on as the official tongue of the E. Byzantine Empire until the fall of Constantinople before the Ottoman Turks in 1453. The immigration of scholars into W. Europe, which then followed, added impetus to a movement already begun in Italy for the revival of Gk. studies; and with the Renaissance Gk. was once more reinstated as a learned tongue, though it never again rivalled the universality of Lat. In G. and the

Levant, however, Gk. still lived on as a spoken language, though the passage of time and the intrusion of many Slavonic and Turkish words and forms had wrought radical changes in the old classical tongue. The 'b' sound, for example, has vanished entirely, the letter 's' now representing a 'v' sound; the grammatical construction has been profoundly modified, particularly in the conjugation of verbs, while the pronunciation of the language has been entirely altered by the conversion of the 'pitch' or 'tonal' accents of classical Gk. into a 'stross' accent.

It is significant that the revival of Gk. nationality at the beginning of the nineteenth century was accompanied and aided by an awakened interest in the ancet. Gk. tongue, initiated by the great scholar Koraes. This movement took the form of an attempt to restore the purity of the language as far as possible by the removal of foreign words and constructions. As a result it is now possible to distinguish two types of speech in modern G.—the 'demotic' or popular (spoken by the populace at large) and the 'purist' Gk., the official language taught in the schools and written in the newspapers, a conscious imitation of ancet. usage purified as far as possible from intruding foreign words. There is no doubt, however, that the latter is steadily gaining ground, and that soon the country will speak no other language.

Modern research agrees with ancet. tradition that the Gk. alphabet has been derived from the Semitic. Indeed it is not difficult to trace the connection between these two scripts. A comparison of the early forms of the letters sufficiently demonstrates their common origin. The phonetic values of the signs are, mainly, the same in both the alphabets, and, still further, the names of the letters and their sequence are the same. Finally while the names of the letters are meaningless in Gk. they are words in Semitic languages. Hence the two alphabets must be related, and as the Semitic is doubtless the earlier the Gk. must depend upon it. When the Gks. took over the Semitic letters they also took over their names.

The date of the adoption of the alphabet by the Gks. is a much vexed question, and various dates have been suggested. In general Gk. tradition assigned the creation of the Gk. alphabet to the Dark Age, and there are many indications that such a date (about the twelfth to eleventh century B.C.) roughly speaking, may be right. This dating has been accepted by many eminent scholars (Kenyon, Hogarth, Bury, Wade-Gerry, Larfeld, Szanto, Diringer), while other scholars (Meyer, Kirchhoff, Gercke, Beloch, Driver) suggested the ninth or even the end of the eighth century (Carpenter).

Was the Gk. alphabet first constructed in one place or in sev.? Some scholars hold that the Gks. received the alphabet from the Semites, 'at several points of contact from whence it was logically diffused among neighbouring cities and their colonies' (E. M. Thompson). Others think that all the local varieties derived from one earlier Gk. alphabet, the creation

of an unknown genius, who must have been a first-rate 'phonetician,' who succeeded in adapting the Semitic purely consonantal alphabet to an idiom belonging to a different linguistic family, and which could not do without vowels. At the same time the Gks. found certain symbols in the Semitic alphabet representing sounds which they did not possess. These were the glottal *aleph* and *he*, the pharyngeal *heth* and *'ayin*, and the 'semivowels' *waw* and *yod* (see ALPHABET). Four of those Semitic letters (*aleph*, *he*, *yod*, and *'ayin*) were made to represent the Gk. vowel sounds *a*, *e*, *i* and *o*, both long and short, the signs for *e* and *o* being also employed for the diphthongs *ai* and *ou* (this continued to be expressed by *o* to a comparatively late period). The Semitic *waw* became the Gk. *digamma* (= the consonantal *u* sound, akin to Eng. *w*); this sound was given up in dialects (e.g. Ionic) in which the letter not being needed was discarded; it survived in other dialects till it became obsolete in classical times, but it continued to be used as the numeral 6. Another form of *waw* supplied the symbol for the Gk. fifth vowel sound, *upsilon*. It was placed at the end of the alphabet following *taw*, but it must have been adopted at the same time as the other Semitic signs, for there is no local Gk. alphabet which is without it. The Semitic *heth* was adopted in the W. branch of the Gk. alphabets (Locri, Ellis, etc.) as the rough breathing; at a later stage it was broken up into two signs (— — | ; — — | —) to serve (1) as the rough breathing (*spiritus asper*), indicating the presence of an *h*-sound, or (2) as the smooth breathing (*spiritus latus*), indicating the absence of the *h*-sound. In the Ionic and Attic alphabets, the aspirate gradually falling into disuse, the *heth*, as Gk. *eta*, was adopted to represent the long *e*. (In the earlier Thera inscriptions, however, the letter *Heth-eta* occurs in both capacities.) At a later stage of development, when the long *o* began to be distinguished from the short *omicron*, the Ionians created the *omega* (which was an augmentation of the *omicron*), and placed it at the end of the Gk. alphabet. The other main adaptations made by the Gks. were (1) the different arrangement of the sibilants; (2) the addition of new consonantal signs, especially the double consonants *phi*, *chi* or *ki*, and *psi*; (3) the disappearance in the E. group (Ionia and Attica) by the fifth century B.C. of the letter *koppa* (Semitic *goph*), which continued to be used as the numeral 90, its place as a letter being usurped by *kappa* (*K*).

The different ways in which these and some other adaptations were carried out permit us to distinguish the various branches of the Gk. alphabet. In practice many little states and different is. had each its own variant, but the Ger. scholar Kirchhoff succeeded in laying down a broad div. of the Gk. alphabets into the E. group (Ionia, Attica, Corinth, etc.) and the W. (Thessaly, Eubcea, Iphoei, Locri, Ellis, the greater part of the Peloponnesus, etc.). It must, however, be

emphasised that many problems, especially the hist. of the Gk. sibilants, are still involved in obscurity. The original Semitic sibilants and their names appear to have become confused either in the course of transmission to the Gks., or rather in the later internal development. The Semitic letter *sawin* seems to be the only one which was adopted as *zeta* in all the local branches, but its pronunciation in early times is not certain and may have varied throughout the dialects between *z*, *ch*, *zh*, and *dzh*. The Semitic *samekh* (which still existed in the Thera and Etruscan alphabets) was retained, as *zei* with the value of *ks*, in the E. Ionic alphabet, while its name, which became *sigma*, was transferred to the last but one letter of the Semitic alphabet, *shin-sin*. This letter, the prototype of the Gk. classical *sigma*, was one of the two symbols employed to express the Gk. sound *s*. The other symbol (found mainly in Thera, Crete, Phocis, Peloponnesus, etc.) derived from the Phoenician *sad*. These two symbols do not appear together in any Gk. alphabet, but they do in Etruscan. The Gk. additional letters *X* and *Y* expressed the *x = ks* and *kh* sounds in the W. group, and the *kh* and *ps* sounds in the E. alphabet. The *Y* seems to have been an anct. variant of the Semitic *kaph*.

Gradually, the Gk. local alphabets approximated more and more to one another. In the course of the fifth century n.c. the Ionian, especially the Milesian alphabet, penetrated and was officially introduced at Athens in 103 the year of Euclides's archonship. The other states followed in the course of the fourth century, and by the middle of this century the Ionian-Attic alphabet became the common 'classical' Gk. alphabet of twenty-four letters.

As the Semitic alphabetic scripts were written from right to left, so in the earliest Gk. inscriptions we find the same order followed. Next came the method of writing known as *boustrophedon*, in which the written lines run alternately from right to left and from left to right, like oxen ploughing a field. Early in the fifth century writing from left to right became universal.

While this 'classical' alphabet was always retained, with insignificant variations, as the monumental script, more cursive forms, all of them being developments from the classical letters, were employed in writing on parchment, papyrus, wax tablets, and other soft materials. It is also obvious that not every kind of text will be written in the same way. First of all there is the book in the narrow sense of the word; this was written, as a rule, by an expert scribe in so-called *scriptio continua*; every letter was standing apart, but neither words nor sentences were separated from each other; this writing is known as *majuscule* or *uncial*. Besides it there was the cursive writing in various forms; the letters became rounded and simplified, and there appeared ligatures of two or more signs. Two main types can be distinguished: (1) the cursive of the bureaucracy and of the professional

scribe (as seen in anct. deeds and documents, in petitions, and official letters, etc.); this type later (in the Byzantine period) developed into a very particular kind of fluent, elegant, large writing, in which the vertical element predominated; (2) the individual cursive, which shows a nearly endless variety ranging from the expert handwriting (similar to that of type 1) to the clumsy scribblings of semi-literate people. Gk. MSS., anct. and medieval, numbering many thousands, form one of the main bases of modern civilisation (see *PALÆOGRAPHY*), while the tens of thousands of Gk. inscriptions (see *INSCRIPTIONS*) are of paramount importance for the study of anct. hist. in all its branches.

<i>Letter</i>	<i>Name</i>	<i>Pronunciation</i>
<i>α</i>	alpha	a
<i>β</i>	beta	b (v in modern Gk.)
<i>γ</i>	gamma	g
<i>δ</i>	delta	d
<i>ε</i>	epsilon	e (short)
(F)	digamma	v (disappeared early from the alphabet)
<i>ζ</i>	zeta	z
<i>η</i>	eta	e (long)
<i>θ</i>	theta	th
<i>ι</i>	iota	i
<i>κ</i>	kappa	k
<i>λ</i>	lambda	l
<i>μ</i>	mu	m
<i>ν</i>	nu	n
<i>ξ</i>	xi	x
<i>ο</i>	omicron	o (short)
<i>π</i>	pi	p
<i>ρ</i>	rho	r
<i>σς</i>	sigma	s
<i>τ</i>	tau	t
<i>υ</i>	upsilon	u
<i>φ</i>	phi	ph
<i>χ</i>	chi	ch
<i>ψ</i>	psi	ps
<i>ω</i>	omega	o (long)

The modern Gk. alphabet is slightly different from the anct. script, and the pronunciation of many letters (especially of the diphthongs) differs from that ordinarily used for the anct. Gk.

Greek Literature is conveniently divided into six periods, viz.: (1) Early literature, ceasing about 475 B.C., and embracing epic and lyric; (2) Attic literature, ceasing about 300 B.C., and including the development of drama and prose; (3) Alexandrian literature, ceasing about 146 B.C., and

producing miscellaneous works of a learned and artificial type; (4) Graeco-Rom. literature, ceasing about A.D. 520, and occupied mainly with critical and historical treatises; (5) Byzantine literature, ceasing about A.D. 1453, and yielding principally scholastic works; (6) Modern Gk. literature, excelling chiefly in lyric and ballad.

Gk. literature attained perfection in all its branches without extraneous influence, and therefore its hist. affords a unique study of the natural order and development of the different species of poetic and prose composition. The first dept. of Gk. letters to reach maturity was the epic, which arose from selection and unification of loose ballads and folk-songs. This branch of literature may be classified as objective and uncritical. Lyric came next in order of development. In theme it is distinguished by subjectiveness and emotional intensity; in form it makes for artificiality and crystallisation. The lyric epoch was followed by the rise of the Gk. drama. The Athenian drama was democratic and individualistic in outlook. In style its tendency was towards naturalness, and thus, while preserving the character of poetry, it assimilated some of the qualities of prose. Lastly Gk. prose developed; in style it advanced from the accidental rhythms of the early writers to the carefully systematised cadences and metrical graces of the later writers. While anct. Gk. literature developed in many directions it nevertheless maintained throughout its entire career characteristics which reflect the distinctive genius of the Gks. As in her art and in her ethics, the keynote of the literature of G. is beauty and power in restraint. This moderation, which is to be carefully distinguished from mediocrity, is an essential feature of the classical spirit. True Gk. chastity never permitted in artistic conceptions the intrusion of sentimentality, elusiveness, and super-elaboration. There is always perfect harmony and balance in thought and expression, in content and form.

The great epics of G. are the *Iliad* and the *Odyssey*, whose authorship is traditionally attributed to the blind bard Homer, and which were composed about 900 B.C. In eighteenth-century criticism the unity of the Homeric authorship was called into dispute, and a highly composite authorship was assumed. The limits of this article prohibit a detailed discussion of the Homeric question, and it must suffice to say that the *Iliad* and the *Odyssey* were undoubtedly inspired by the folk-songs of the ballad epoch, and that their respective unity of thought and perfection of structure compel us to admit that each must have taken its final form "from the magic hand of a great poet. The spring of the poems is a cycle of anct. tact from ballads. The Aeolic bards of among 'not transfigured and transformed colonies' (i.e. songs, but their final form think that empress of Ionic genius. The from one ear written in hexameter verses, unknown antiquity, and

occurring in most anct. Delphic oracular responses. The so-called 'cyclic poems' continue the epic hist. They complete the story of Troy, but are inferior in conception and design to the Homeric epics.

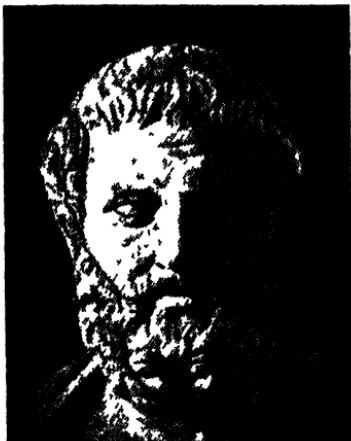
The poems of Hesiod (*f. c. 735 B.C.*), the next great poet in the hist. of Gk. literature, form a striking contrast in subject and treatment to the Homeric epics. The Homeric heroes seem almost to enjoy participation in the blithe life of the gods; the atmosphere is clear, the prospect luminous. The hand of fate does indeed loom over gods and men, but the inevitable decrees are accepted with calm and unperturbed submission. For Hesiod the world is rough and rugged, and the heavens are far distant. Nature is a hard task-mistress demanding of man unceasing toil. Hesiod's gospel is veritably a gospel of work. Xenophanes, Parmenides, and Empedocles, the early natural philosophers, continued the tradition of didactic poetry.

The so-called Homeric hymns do not synchronise with the composition of the *Iliad* and *Odyssey*. They belong to the sixth century, and are probably preludes which were sung by rhapsodists at the recitals of the Homeric epics at the Panathenaea.

Gk. lyric, like Gk. epic and Gk. philosophy, was primarily the inspiration of colonists in Asia Minor, the period of colonisation being marked with phenomenal activity in all spheres of thought and action. The chief lyric species were elegiac and iambic. The distinguishing feature of Gk. elegiac verse is its universal range of application. Thus Callinus (690) and Tyrtrus (640) adapt it to martial themes, Mimerne (620) to erotic, Solon (600) and Theognis (550) to gnomic, and Archilochus (600) and Simonides (530) to funeral. Iambic verse approximates more closely to a colloquial form, and hence is best adapted to a satiric and controversial vein. The instrumental accompaniment which had originally been indispensable to elegiac and iambic verse gradually fell into disuse, and melic verse (or verse inseparable from an instrumental accompaniment) was represented by two new orders, the Eolian and Dorian modes. The Eolian mode was monodic and personal; the Dorian was choral and civic. The greatest achievements in Eolian verse were attained by Sappho; her poetry excels in intensity of passion and beauty of melody. Unsurpassed in the Dorian mode is Pindar, whose odes are inimitable in majesty of thought and grandeur of expression.

Tragedy was gradually differentiated from the dithyramb, a triumphant hymn to Dionysus. Arion and Stesichorus are shadowy names in the early hist. of the dithyrambic chorus, but the name of Thespis brings us to the fringe of hist. Thespis first introduced an actor or answerer (*unopptos*), and thus dialogue between the leader of the chorus and the actor was now effectuated. Phrynichus, author of the historical plays, the 'Capture of Miletus' and the 'Phoenissae', employed

without alteration the dramatic frame-work invented by Thespis, and no further innovation was made till the daring genius of Aeschylus (b. 525 B.C.) startled the Athenian audiences. Aeschylus gave to Attic tragedy the form in which we know it. The reforms which are usually ascribed to Aeschylus are these: (1) He founded the classical div. of plays at the Dionysia. First were represented three tragedies (*tragoidia*), then followed the 'satyr' play, which had regularly the chorus of satyrs and combined all the humorous elements which hitherto had been more or less scattered over all four plays. The only exception was in the nominally 'satyric' plays like the *Alcestis* of Euripides and the *Inachos* of Sophocles.



SOPHOCLES

(2) He brought in a second actor. This new departure, providing two actors in addition to the leader of the chorus, enabled the dialogue to become more complex, for an actor might take more than one role. (3) He made the dialogue mainly bear the burden of the dramatic action. His chorus, though still playing an independent if somewhat colourless part, is subordinate to the actors. (4) He placed in the rear of the orchestra a wooden booth, the *skene*, which served as a dressing-room as well as background to the scene of action; and he is said to have invented scene painting. (5) He made the actor sing as well as the chorus, giving him not only monodies, but also a part in a musical dialogue which he conducted with the chorus. An important result of this was that the original Doric rhythms of choric song became modified by the introduction of both Aeolic and Ionic solo measures, including the iambic and trochaic. (6) He formed the ponderous tragic style which, until Euripides dared to free himself in part from its conventional fetters, was de-

manded of all writers of tragedy (*consult Aristotle, Poetics, 10*). The leading thoughts in the drama of Aeschylus are bold and emphatic. There is a power manifest in the universe which makes for righteousness, and by putting himself in harmony with its tendencies man wins happiness. Through suffering man learns the will of the gods, but an insolent and overbearing attitude brings sorrow even unto the third and fourth generations. To Sophocles (b. 496 B.C.), a younger contemporary of Aeschylus, are also ascribed technical improvements in the construction and production of tragedy. Tradition attributes to him the introduction of a third actor, and (by some) the invention of scene painting. The motive idea in the tragedies of Sophocles is less vast than in those of Aeschylus. The chief interest in the Aeschylean drama is in the ultimate and universal problems; the central issue in those of Sophocles is concerned with individual ethics and psychology. In the elder tragedian man is engaged in a titanic struggle with destiny; the religious conceptions of the younger dramatists have ripened to a mellower loveliness. With the third of the great tragic writers of Athens the dramatic atmosphere has quite altered. The sublime elevation and stately repose have vanished before the ferment of moral perplexity and religious doubt. The aim of Euripides is occasional effect rather than sustained solemnity. Tender sentiment and tempestuous passion reflect the clear rays of spirituality. Instead of the natural being transformed into the supernatural, the supernatural is transformed into the natural. There is discord in the plays of Euripides, a discord between character and environment, between rationalistic thought and mythical tradition, between the movement of the plot and the function of the chorus. These are faults of a transition period, for Euripides was too far in advance of his age to harmonise his thoughts with its artistic conventions. But in his humanity Euripides reaches heights undreamed of by his great predecessors. He sympathises with the slave, the barbarian, and the weak. His portraiture of women is characterised by a tenderness and sympathy that are strangely modern. In the *Alcestis* he abandons the dramatic traditions and even introduces children. If the Euripidean drama, as a whole, is unequal, unsymmetrical, there are nevertheless passages whose loveliness and beauty are unsurpassed by anything in Gk. literature.

Comedy, too, had its origin in the cult of Dionysus. The occasion of harvest thanksgiving gave rise to extempore farces, which in the course of time took literary shape. Aristotle, in the *Poetics* says that comedy sprang from the phallic choruses of these festivals. Such choruses were probably abusive and derisive, and were directed against such personages as were conspicuous enough to excite the interest of the assemblage. The temperament of the Sicilians was especially conducive to the development of comedy, and in Sicily it first reached

literary excellence and acquired permanent value. Epicharmus of Cos (b. c. 535 B.C.) was the greatest of the early Sicilian comedians. Previous writers had produced the comedy of situation, but Epicharmus created comedy of plot and character. Political satire is, however, absent from Sicilian comedy, which ridicules the type rather than the man. The chorus is altogether absent. Attic comedy falls into three divs.: the Old, the Middle, and the New. The Old Comedy flourished from 450 to 390, and was characterised by broad and undisguised railing of contemporary events and living personages. It was a product of the political independence and fearlessness of the Athenian democracy. As the democratic constitution of Athens waned comedy ceased to be personal. Middle Comedy flourished from 390 to 320. It satirises movements and factions, philosophy, literature, and other contemporary arts; but personal satire and the chorus have practically disappeared. The New Comedy flourished from 320 to 250. It is distinctly a comedy of manners and character; domestic intrigue takes the place of political situation, and the 'sack' is worn by the man in the street instead of the statesman. Aristophanes far eclipses contemporary writers of the Old Comedy. His belief in the high calling of his art saved him from the grotesqueness and coarseness which before his time seemed inseparable from comedy. He was, above all, a patriot, and it is his pride in the art, institutions and hist. of his country that impels him to use his ridicule as a scourge against adventitious experiments and innovations in civil government and morality. Conservative in his ethics, he vehemently attacks the disquieting influence and negative teaching of the Sophists. Socrates's intellectual and philosophical empirics he regarded as a public danger worthy of reprobation and exposure. The charm of his style is unrivalled, except in the Attic idiom of the dialogues of Plato. But Aristophanes is a poet as well as a comedian. Passages of exquisite beauty and sentiment are intermingled with the mockery and the railing. The gradations of the transition from the Middle to the New Comedy are not clearly defined. In some of the plays of Aristophanes the political licence and overt criticism are already abandoned. Thus in the *Phutus* he discards concrete censorship and adopts symbolical farce. For examples of the New Comedy we were for long dependent on the Lat. imitations of Terence, but the recently discovered fragments of Menander now afford us a representative body of that dramatist's original work. Menander excels in his delicate delineation of character, the subtle construction of his plot, and the consummate purity of his idiom.

Gk. prose, as is natural, attained complete development at a much later date than poetry. The earliest examples of prose in G. belong to the sixth century B.C., and these are chiefly records and chronicles quite unpretentious in style

and expression. The Ionian philosophers made considerable advances, but their aim also was mainly didactic, and where style is studied it is for lucidity. Herodotus, the historian (b. 484 B.C.), is the first conscious prose stylist. The structure of his hist. is dramatic. His inspiration was the momentous drama of the Persian wars. He traces the conflict of E. and W. up to its great crisis, marking the intricate chain of cause and effect with insight worthy of an evolutionist, but he abandons the role of critical and scientific historian in his acceptance and narration of legends whose value is purely dramatic and artistic. It is the unity of his design and the graphic drama of his narrative that won Herodotus the title of 'the Homer of historians.' In the structure of his sentences Herodotus adopted the loose style. Thucydides (b. 471), the next great writer of hist., is a contrast to his predecessor, both in conception and design. The field of Thucydides's activity is the Peloponnesian war. He wrote when G. was no longer self-assured and buoyant in the glory of victory. She was torn by intestine strife, and was the sport of unprincipled statesmen and generals. The scene presented much food for reflection and moralisation. The hist. of Thucydides is no heroic epic, inclusive, sedulous, judicial, the genius of Thucydides as a pure historian is undeniable. He makes no parley whatever with seductive legends and traditions irreconcilable with a calmer rationality. He sifted evidence meticulously, and indefatigably consulted all available documents relative to his subject. Only in his speeches did he allow himself freedom. These he meant to be true to the spirit and not to the letter. His style, too, is illustrative of his mental character. He builds his sentences on the periodic system, lucid, pregnant, and severe. His idiom is pure and unadulterated Attic. Xenophon (b. c. 429 B.C.) was essentially a man of action. He therefore excels in brilliancy, vividness, and freshness, but both in intellectuality and style he falls far below the level of Thucydides. His finest work is perhaps the *Anabasis*: racy, virile, dramatic, the narrative compels interest, but is neither wholly trustworthy nor convincing. Political economist, historian, philosopher, the range of Xenophon's activities is wide, but he is lacking in intellectual power and thoroughness. Plato (b. 427) is as great a stylist as he is a philosopher, and praise can go no higher. Richness without satiety, grace without elaborateness, and charm without conceit make the dialogues of Plato models of literary excellence for all time.

Though eloquence was appreciated and cultivated in G. as far back as the time of Homer, oratory as a science and art was only first formulated at the time of the Peloponnesian war. The chief reason for the lateness of the development of the rhetorical art is that it depends on the study and cultivation of prose composition, and this, as has been said, matured much later than poetry. It was

In Sicily that the first treatises on rhetoric were written, the demand for such systems being caused by the need of effective speech in the innumerable lawsuits which arose during the redistribution of land on the overthrow of the Syracusan tyranny. Corax (*f.* 467 B.C.) and his contemporary, Tisias, were the earliest of the Sicilian rhetoricians, but their theories were rudimentary, consisting chiefly in the differentiation of the various parts of a speech. The argument from probability had a conspicuous place in their method. Gorgias of Leontini, sent from his native city in 427 B.C. as an ambassador to Athens, attracted the admiration of the Athenian audiences by the splendour and brilliance of his oratory, and hence the art was transplanted to Attic soil. The style of Gorgias was florid and luxuriant. The Alexandrian critics selected ten Attic orators as being of the foremost rank. Each orator exemplified a peculiar excellence in style. The perfect harmony and balance of all the excellencies of style were attained by Demosthenes (*b. c.* 384), the greatest of the Attic orators, who blends perfectly the virtues of his predecessors and reproduces none of their excesses. But the secret of Demosthenes's enormous power of eloquence was a moral force generated from the soul and quickening to vital potency the technical graces and devices which he commanded. Alexander, after the sack of Thebes, demanded the surrender of the Athenian orators, and Gk. liberty and Gk. oratory perished side by side. Robbed of its political significance, oratory in the Macedonian age degenerated into declamation and style into ornament. Asiatic affectation conquered Attic purity.

But the victories of Alexander diffused Gk. letters and Gk. culture over half the world. Gk. became the 'common tongue,' and thus the spread of Christianity was facilitated by the victories of the pagan sword. It was in Egypt that the scattered Hellenic seeds produced the most exuberant growth. Alexandria became the cap. of the intellectual world; but the new Gk. literature was vastly different from the autochthonous literature of free G. The spirit of Alexandria was cosmopolitan and not patriotic. The promoters of the new literature were couriers and grammarians, and their work is characterised by learning and artificiality. Genuine inspiration and high seriousness are lacking in the poetry of Appollonius Rhodius (222-181), Aratus (*f.* 270 B.C.), author of *Phaenomena*, which was very popular in ancient times, Lycophron (283-247), author of an extant poem, *Cassandra*, in which the prophetess predicts the fall of Troy, and Callimachus, chief librarian of the famous library at Alexandria from c. 260 until his death in 240. But the Sicilian Theocritus (*f.* 270 B.C.), although enticed to the Alexandrian court by the lavish patronage of Ptolemy Philadelphus, never lost the freshness and warmth of sentiment which the rural surroundings of his youth had inspired. His idylls of Sicilian

pastoral life are representations of genuine rustic character and incident, and clothed in the rich sweetness and charming simplicity of the Doric idiom. Moschus (*f.* c. 150 B.C.) and Bion (*f.* c. 100 B.C.) continued the pastoral tradition at Alexandria, but though their elegies excel in grace and delicacy, in naïvete and spontaneity, they pale before the Theocritan idyl.

When compared with the literature of free G., that of the Greco-Rom. period is inferior. But though the Greco-Rom. period produced no literary work of the highest merit, it nevertheless gave proof of a vigorous intellectual activity, which is all the more remarkable in face of the national calamities. The historian Polybius (*b. c.* 204 B.C.), in spite of the immense scope of his work and the wide field of his activities, is a sane and reliable thinker, and the style of his *General History* was much admired, though it exemplified post-classical innovations in vocabulary and phraseology. Plutarch's (*b. c. A.D. 46*) *Lives* will live on account of their dramatic power. The wit and satire of Lucian (*b.c. A.D. 12*) are always lively and refreshing. Longinus's (*b. c. A.D. 213*) work *On the Sublime* shows a singular appreciation of beauty and keenness of critical insight.

The Byzantine literature was purely retrospective and produced nothing of permanent value. Among the historians are Procopius (*f. A.D. 530*), Porphyrogenitus (*f. 910*), Zonaras (*f. 1120*), and Critobulus (*f. 1450*). The most famous critics of Byzantium were Photius (*f. 850*), Suidas (*f. 950*), and Eustathius (*f. 1170*).

Neo-Hellenic poetry is chiefly bucolic. The first poet writing in modern Gk. who attained literary eminence was Theodoros Prodromus (*f. 1200*). Drimiticos (*f. 1625*) wrote a pastoral entitled *The Fair Shepherdess*, which contains passages of touching beauty. In 1824 Faurel made his famous collection of modern Gk. ballads. These spirited verses deal for the most part with the Klephts, who so heroically raised the standard of Gk. independence. In more recent times the patriotic lyrics of Righawero were praised by Byron. The amorous Anacreontics of Christopoulos have considerable charm and beauty. Adamantios Korais (Diamant Coray, 1878-1933) lived and wrote in Paris. The brothers Soutsos show considerable lyric power. Rangarlis is perhaps the greatest of modern Gk. lyricists. The lyrics of Calvos and Salomos are graceful, but slight. The works of Salomon Palamas may be regarded as the best precursors of the modern school led by Angelos Sikelianos (*b. 1883*). But foremost among the younger poets is Odysseus Elytis (*b. 1912*), whose *Orientation* (1939) and *Sun the First* (1943) have attracted the attention of the Athenian literary public. These poems are very difficult to translate, for, like the Sitwells, Elytis relies on the sound of words for their effects, and his poems are also impressionist in their technique. What the Gks. admire in his

work is its pagan exultation in the physical and sensuous joys of life and nature.

Greek Philosophy originated in the Ionian colonies of the E. The cults of the Gk. mainland were essentially local, so the early colonists left their gods behind them in the motherland and settled in their new home with minds free for speculative inquiry. The Ionian philosophers of the sixth century B.C. were principally physicists and cosmologists. They sought to reduce the universe to a first principle or single element. Thus Thales postulated that the origin of all things was water. Anaximander took for his first principle 'the infinite,' which he conceived as being

promising anthropomorphism of the Gk. Pantheon. His theory of the universe is based on 'the one' as opposed to 'the many,' i.e. on an essential unity as opposed to an essential plurality. Parmenides is the author of the apothegm, 'The "ent" (*ον*) is, the "nonent" (*μη ον*) is not.' He identifies the 'ent' with truth, knowledge, and the 'one.' His disciple Zeno, to disprove 'the many,' invented some famous paradoxical arguments relative to space and time. A reaction followed in favour of 'the many' as opposed to 'the one.' Empedocles held that the evolution of the universe was conditioned by the segregation and aggregation of the four elements under the influences of hate and love. Anaxagoras postulated 'atoms' and a 'governing mind.' Democritus and the atomists conceived the universe as generated from atoms falling in space. They postulated the power of deflection in the atom, and hence made aggregation possible.

The sophistry of the humanists was a complete reaction from the natural philosophy of the physicists. In the teachings of the new school the macrocosm was of secondary importance as compared to the microcosm. Though the Gk. sophists had no doctrine in common, they all based their speculations on an initial scepticism. Their influence was negative rather than positive, destructive rather than constructive. The famous aphorism of Protagoras is characteristic of the sophists' mode of thought—'Man is the measure of all things, of what is, that it is, and of what is not, that it is not.' The empirics of the sophists did not immediately benefit Gk. thought and morality, but they paved the way for the advent of Socrates.

Though Socrates is justly called the father of critical philosophy, he never committed his doctrines to writing. Our knowledge of his theories and principles is derived from two of his disciples—Xenophon and Plato. Formerly Xenophon was regarded as the more trustworthy authority, but in recent years there is evidence of a reaction in favour of Plato. Socrates followed the sophists in having his theories on a primary scepticism or agnosticism; he was also at one with the sophists in applying empiricism as a final infallible test of all theories. The dialectical method of philosophical inquiry was the invention of Socrates. He himself assumed ignorance, and by deferential interrogation he elicited from some bystander an opinion on the subject he wished to investigate. Starting with this dogmatic assertion of the respondent, he proceeded by a systematic series of questions and answers to lead his interlocutor up to a consequence inconsistent with his primary proposition. This was the so-called *ελύσις*, or destructive process; the false opinion has been swept away, and the mind is now unprejudiced for the receipt of a substitute. The new opinion was reached by induction, from the respondent's admissions in a fresh series of interrogations. Most often the subject of this philosophical research was a defin-



ZENO

intermediate between the elements. Anaximenes selected air as the primary substance, from which he held the universe was evolved by the processes of rarefaction and condensation. Heraclitus, the last of the Ionian school, adopted fire as his basic element. He was also the originator of the theory that the universe is in perpetual flux. The philosophical teachings of Pythagoras of Samos were of a psychological and religious character. The theory of numbers played an important part in the Pythagorean doctrines. Harmony was built on numbers and was, according to Pythagoras, the key to the universe. Among the religious tenets of the sect the doctrine of metempsychosis had a foremost place and inspired the brotherhood to observe a life of religious asceticism. The Pythagorean philosophy was largely influenced by the Orphic mysteries, in which immortality and spiritual purification were the leading ideas. Xenophanes was the founder of the Eleatic school. He was the first Gk. rationalist, boldly attacking the uncon-

tion, and the mass of definitions attained formed Socrates's ethical system. Virtue, he held, consisted in the knowledge of such definitions and opinions; for right action, he conceived, was the logical consequence of right knowledge. Virtue is knowledge and knowledge is the 'good.' The proof and justification of these Socratic axioms were found in utility.

Until recently the doctrines of Plato were treated as a reaction from, rather than a development of, those of his master, Socrates. Plato was regarded as a pure idealist and Socrates was classified as an uncompromising empiricist. The point of departure was the Platonic theory of ideas. But critics are beginning to take another view of the matter. The extremists not only find in the Socratic final definition an adumbration of the Platonic theory of final ideas, but also credit Socrates with the full-fledged theory. Thus the modern tendency is to emphasise Socrates's indebtedness to the abstractions of the Pythagoreans rather than his indebtedness to the empirics of the sophists. But be that as it may, the ideal theory is chiefly associated with Plato's expositions. The Platonic hypothesis is, briefly, that transcribing the plural phenomena, which are mutable, imperfect, temporal, generated, and opined, there are single Ideas which are immutable, perfect, eternal, ungenerated, and known. Beyond the Ideas is the Idea of Ideas, the 'supreme good.' The ideal life is the philosophical life of approximation to, and contemplation of, the Ideas. The soul is akin to the eternal Ideas; the body is related to the ephemeral phenomena.

Aristotle bodily rejects Plato's theory of Ideas. His philosophy is inductive. According to Aristotelean conceptions, it is the species which exists and can be known. From the species his metaphysical and transcendental hypotheses are derived. Aristotle's system of ethics¹⁴ is based on empiricism. Man's chief end is the attainment of true happiness, and happiness consists in an energy of the soul, which accords to virtue. Virtue is of two grades, moral and intellectual. Moral virtue is attained when man's rational being correctly governs his appetitive and emotional being. The prime virtues are nine, of which seven are moral and two are intellectual. The moral virtues are courage, temperance, liberality, munificence, magnanimity, self-respect, and gentleness. These virtues are really 'means' between immoral 'extremes,' e.g. courage is a mean between rashness on the one hand and cowardice on the other. Towards the attainment of these virtues a sufficiency of the world's goods contributes. The intellectual virtues are judgment and wisdom. The highest life consists in the exercise of the intellectual virtues, and is the philosophical life of contemplation. The moral life consists in social action, and is inferior only to the contemplative life.

The Academic school founded by Plato and the Peripatetic school founded by Aristotle are the prin. philosophical orders of G. The minor schools which arose

diverged from the two rival systems and became extravagantly metaphysical or extravagantly material.

Epicurus dismissed the abstractions of the speculative idealist and founded a new philosophy on the sensations of the practical materialist. The senses were regarded as infallible, and the chief good in life was happiness. But happiness is of two kinds. There is exciting carnal pleasure and there is also tranquil mental pleasure. The latter Epicurus pronounced supreme. In his theory of the universe Epicurus revived the atomism of Democritus. All that is is corporeal and composed of atoms; soul itself is but a harmonious combination of finest atoms.

The Stoic school was founded by Zeno; its doctrines are largely eclectic. Antisthenes, an immediate follower of Socrates, had founded the Cynic school, whose chief aim was an austere asceticism. The Cynics taught that virtue was alone worthy, and happiness was madness. A minimum of the world's goods was essential for the practice of the virtuous life. These tenets Zeno at first embraced, but latterly modified with views borrowed from various antithetical systems. The Stoic doctrines gravitated round two central and corresponding ideas—the unity of the macrocosm, or universe, and the unity of the microcosm, or man. The macrocosm was conceived as a living organism governed by intelligence, which underwent transformation from, and re-absorption into, its primitive substance or being. The microcosm also is governed by intelligence, survives death, and attains thereby true being. The basis of Stoic ethics is harmony between the microcosm and the macrocosm. Such harmony is attainable by man when he leads a life of moral virtue. There are no gradations between good and evil. The ideal man of the Stoic philosophy is self-sufficient, free, misled neither by error nor emotion, and in no wise inferior to a god. But whilst the Stoics emphasised self-sufficiency, they did not neglect the duties of social life. All men, whether Gk. or barbarian, bond or free, were citizens of the world-city of God. The humanity inspired by these doctrines tempered the exclusiveness and rigidity of Gk. patriotism, and brought comfort during the stress of national calamities. Stoicism was in complete harmony with the finer Rom. ideals. Its most beautiful and noble interpretation is the book of *Meditations* by the Rom. emperor, Marcus Aurelius. It was the one lamp which shone in the spiritual darkness of the empire, and no remains of antiquity present a nobler view of philosophical heathenism.

Greek art is conveniently considered under three heads: painting, architecture, and sculpture. The architectural and sculptural remains are considerable and representative, but extant examples of paintings are scant, and, for the most part, belong to the periods of immaturity and decline. Specimens of Gk. vase painting are plentiful, but they possess the disadvantage of giving us no adequate idea of the development of the use of

colours. Excavations in Knossus and Mycenae have revealed examples of Gk. vase painting which belong to the millennium 2000-1000 B.C. The vases are exceedingly beautiful in shape, and the painting is of a very vigorous and free type. There are some examples of geometrical and conventional designs, but the finest specimens exhibit free drawings of plants, animals, and human figures, which can bear comparison with the most beautiful products of the Hellenistic age. The Dorian conquests checked the development of Mycenaean or prehistoric Gk. art, and the art of vase painting was arrested with the sister arts. The earliest specimens of Attic art are of the geometric type; the figures are rigid and the balance is laboured. Prior to the sixth century B.C. light red clay was used and the figures were painted in rich black glaze. Lines of physiological and ornamental detail were incised on the black with a fine point. Other colours were frequently superimposed after the firing of the black—notably white and purple. But the effect of these black silhouettes on the light background was always grotesque and not seldom ludicrous. In the sixth century B.C. a complete reversal of this arrangement was effected. The figures were left in the light ground-colour, and the background was superimposed in black glaze. Details in the figures were then drawn in fine lines of glaze. The red-figure vases comprise the most beautiful specimens of Attic vase painting. In the period of the decline white washes were frequent in the red-figure vases and simplicity of design was abandoned for elaborate detail. The Gks. painted their statuary, though surviving examples are extremely rare. In the Acropolis Museum at Athens there was a figure called the 'Hydrophorus' which bore traces of its original paint. This rare treasure was irreparably damaged by Brit. soldiers in 1914. Our knowledge of Gk. mural and easel painting is mainly derived from critical comments scattered through classical authors. There are indeed extant specimens of Gk. prehistoric wall painting found at Mycenae and Knossus, and, like the vase painting of the same period, they show a remarkable beauty of conception and freedom in execution. Polygnotus was the first great Athenian mural painter. He flourished during the inspiring epochs of the Persian wars. He is especially commended for his treatment of human expression and his skill in representing drapery. At the close of the fifth century mural painting was succeeded by easel painting. Perspective was studied more carefully by the younger school, and the effect aimed at was emotional and sentimental. Zeuxis is the representative painter of the period. He was most successful in his delineation of the female figure, especially in the nude. The 'Helen' of Zeuxis in the temple of Hera at Crotone was his most perfect achievement. The Attic school was characterised by its free naturalness, and the representative names are Euphranor and Nicias. Apelles, the greatest of all the anc. painters,

belonged to the Ionic school and flourished about 330 B.C. His works were chiefly portrait painting—a new departure in Gk. art, which flourished under Macedonian court patronage. The ideal element entered into his portraiture, through the addition to his subject of mythological or symbolical motifs. Thus he painted equestrian portraits of Alexander the Great in company with the Dioscuri and leading War in chains behind him. His most famous picture was, however, a mythological subject entitled 'Aphrodite Anadyomene.' It represented the goddess in the nude, rising from the sea and wringing the water from her hair. The descriptions of this picture give us some conception of that peculiar 'charm' by which the ancts. characterised the works of Apelles. In conception sentimentality and in treatment super-elaboration vitiate the art of the decline; in subject genre paintings predominate.

Prehistoric Gk. architecture (*q.v.*), as revealed to us by excavations in Crete, Mycenae, Tiryns, and Troy, was of a very massive and substantial type. A characteristic feature was the so-called 'Cyclopean walls' whose giant structure imagined the anc. attributed to the Cyclopes. The stone walls of domestic buildings on these sites only reached an elevation of a few feet, the superstructures consisting of wood and cement work. The column had already differentiated itself in Mycenaean architecture.

Mycenean civilisation disappeared during the general upheaval that followed the Dorian invasion. With these Dorian invaders is connected the differentiation of the Doric order, one of the three characteristic architectural orders of G. The column is the distinguishing feature of these orders, and was itself no doubt evolved from the tree-trunk props of primitive structures. In G. the column was fluted and tapered slightly upwards, thus producing the combined effect of stability and grace. The Doric column is the boldest, simplest, and most impressive. The fluted shaft rests directly on the foundation step or floor with no intervening base, and is capped by a simple square abacus. In the noble beauty and perfect proportions of the Parthenon at Athens (*q.v.*), the Doric order finds its most sublime expression. The architecture of the Ionic order gains in delicacy, but loses in sublimity. The shaft of the column is also fluted, but the flutes, being separated by flat fillets, do not intersect as in the Doric pattern. The shaft rests on a plinth or base, and culminates in the characteristic volute. The finest examples of the Ionic order are the remains of the temple of Nike Apteros and the Erechtheion at Athens, whose chaste beauty and symmetry are incomparable. The Corinthian order is more susceptible to elaboration and embellishment. Tradition ascribes its invention to Callimachus, who drew his inspiration from a votive basket filled with the twining leaves of the acanthus plant. The Corinthian column follows the Ionic in all detail except the capital,

which represents a cluster of acanthus leaves. The finest specimen of the order is the Olympieion at Athens. This order, unlike its sisters, admitted superfluous detail and enrichment, and with variations was almost exclusively adopted by the Romans.

The finest work of the Gk. architects was devoted to the building of temples. These, like those of the Hbs. and other nations, were, for the most part, built upon hill-tops. The primary function of the Gk. temple was to enshrine the statue of the deity. The statue was placed in the main chamber or *naos*, whose great doors faced E., and which was flanked with colonnades. The *naos* was divided into two chambers. The whole was surrounded by an external ambulatory, termed the *Peristyle*, which was also flanked with colonnades. The temple was frequently adorned both within and without with magnificent sculpture and mural decoration.

Gk. architecture is characteristic of Gk. genius. At its best it is strong but not stern, simple but not plain, noble but not overwhelming; it is beautiful yet chaste, restrained yet powerful, clearly definite yet infinitely suggestive. Here there is nothing in excess, but the realisation of that mean of means, neither too little nor too much.

Gk. sculpture was closely associated with temple architecture. The temples enshrined the statues of their respective gods and the metopes were adorned with the choicest achievements of glyptic art. Faithfulness to nature, combined with the worshipful and dedicatory spirit of idealism, are the essential qualities of Gk. statuary. The ideal and the inspiration came from the gods, whose perfections the Gk. sculptors sought to portray, but the type and model were derived from the palestra, where Gk. athleticism had moulded the human physique to superb proportions. Thus was the ideal realised and at the same time the real idealised.

Just as the temple column was evolved from the rude tree-trunk that supported the primitive dwelling, so the perfect statue was evolved from a rough-hewn trunk, which represented some deity. Sov. examples of this block type of wooden image existed in classical times. A rough wooden block in the Parthenon was revered as being the most anct. statue of the goddess Athena. Herodotus refers to similar representations of the Dioscuri, and the Hermes busts which stood in classical times at the cross-roads mark the transition stage from limbless block to perfect statue. In the early stages of the art the pose is simple and the arrangement of the members is absolutely symmetrical, the legs being stiff and close together and the arms hanging straight and rigid. The drapery of these early types falls in stiff perpendicular folds, showing no indication of the form beneath. Muscles and other physiological details are but imperfectly rendered. One of the finest productions of this early period is the famous 'Chariloteer' from Delphi (c. 480 B.C.). The stiffness of the drapery and the simplicity of

the pose are indications of the archaic conventions, but the suggestive poise of the head and the slight backward bend of the body give to the attitude a forcible truth which harbingered greater developments. The works of Pythagoras and Myron (fl. B.C. 431) bring us to the very threshold of sculptural maturity. These sculptors were most successful in representing athletic types. The celebrated 'Discobolus' of Myron is a most complex pose, but there are indications of archaism in the lack of suppleness and flexibility.

Pheidias, the greatest sculptor of anct. G., was b. about 450 B.C. He thus flourished in the period when G. flushed with her victories over the Persians, realised for the first time her infinite potentialities. It was an age of great inspiration, an age which produced Pericles, Pindar, Aeschylus, Sophocles, Euripides, and a galaxy of lesser stars. The colossal works of Pheidias were the gold-and-ivory statue of Athena Parthenos, the bronze statue of Athena Promachos, and the gold-and-ivory statue of Zeus at Olympia. Unfortunately these statues have all perished. The 'Athena Parthenos' represented the goddess wearing the 'egis,' and bearing in her right hand a statuette of victory. In the great bronze statue on the Acropolis the goddess was represented in full armour: the figure dominated the city and was a landmark to ships at sea. Pheidias drew his inspiration for his colossal Zeus from Homer's description of the thunderer (*Iliad* i. 527). The power of this statue has this anct. tribute. 'Let the man who is sick and weary of soul, who has suffered much sorrow and tribulation, and whose pillow is visited not by kindly sleep, but stand before the image, and he will, I deem, forget all the terrors and troubles of human life.' Examples of sculpture of the classical period are comparatively rare. They are known to us through Greco-Rom. and Rom. copies. From the sculptures of the Parthenon, however, we derive our first-hand knowledge of the works of Pheidias and his school. The E. and W. pediments contained the finest sculptures. The 'Theseus' (of the E. pediment) is a nude figure in repose, yet the very calmness is suggestive of power and potentiality. The so-called 'Three Fates' (also of the E. pediment) is a harmoniously balanced group of singular beauty: the draperies fall in soft and clinging folds exquisitely revealing the physiological details of the figures. The Elgin marbles (q.v.) (Brit Museum) are from the frieze, and represent the procession of the Panathenaea. Polycletus of Argos (c. 452-412 B.C.) as an artist approached most nearly to an equality with Pheidias. The characteristic feature of the works of Pheidias was sublimity; nobility is the distinguishing quality of the works of Polycletus. The massive and splendid figure of the 'Doryphorus' is characteristic. This statue became known as the 'Canon,' as embodying a perfect representation of the ideal human figure.

Characteristic of the transition period is

the 'Eurene with Infant Plutus' of Cephisodotus. The stiff folds of the drapery are archaic survivals, but the sentiment in the poise of the head and expression of the faces are indicative of the coming age of emotion and sentiment.

The representatives of the new school are Scopas, Praxiteles and Lysippus. In this school representations of the human figure and the minor deities predominate.



APOXIOMENOS

After Lysippus

The restraint and repose of the Phidian school have given place to the emotional and the sensational. Scopas was particularly successful in representing tension and frenzy. The works of Praxiteles, chiefly representative of the minor deities and those in their more sensuous aspect. His 'Cnidian Aphrodite' (copy in Vatican) was a nude figure of the goddess about to enter the bath. It was ranked by the ancients next to the Zeno of Phidias. His statue of Heracles with the infant Dionysus (from Olympia), though exceedingly beautiful

has indications of that softness and sensuality that prevailed in the decline. Lysippus is the last representative of the loftier traditions of Gk sculpture, and he is not guilty of the sentimentality already visible in Praxiteles. His sculpture is rather of the bold, virile, leonine type, as his 'Apoxiomenos' witnesses.

In the third century B.C. the chief centres of Gk art were Pergamum and Rhodes. Exaggeration and sensationalism are characteristic of the schools, exaggeration of muscle and sinews in male figures and of softness and roudure in female figures, sensationalism in the choice of dramatic and harrowing subjects. Representative of the former school is the figure of the 'Dying Gaul' of the latter the 'Laocoön' group. These show great technical power.

In the Greco-Roman period the art of sculpture is mainly imitative and unproductive. The period, however, produced some beautiful works, inspired by a fine eclectic spirit, if not by creative genius. The loveliest of these are the 'Venus of Milo' (Louvre), the 'Apollo Belvedere' (Vatican), and the 'Diana of Versailles'.

Archaeology — The importance of archaeology (*q.v.*) lies in the fact that it is, with ancient literature, our main source for study and appreciation of the history and culture of the past from which our thought and institutions have developed. The Greeks of the classical age were not conscious of any debt to former periods and they were but little interested in the past. Thucydides added to his hist. of the Peloponnesian war a chapter on archaeology, and Plutarch in the second century A.D. was the author of the *Peregrinus of Greece*, a work of lasting value for its references to Gk sculpture and the archaic period. In the eighteenth century European travellers brought back works of art belonging to the Hellenistic age. The Society of Dilettanti commissioned architects to make drawings of buildings in Athens and Asia Minor and in 1801 Lord Elgin began his collection. It was not, however, until the liberation of G. from the Ottoman yoke (1821-29) that anything like systematic excavation became possible. In 1830 the Gk authorities began the task of clearing the Acropolis and this work has gone on until in our own day we have a clear picture of this most famous site not only as it was in the age of Pericles, but also its complete hist. from the most remote period of its settlement.

Apart from the supremely important architectural evidence thus brought to light, perhaps the two most noteworthy discoveries have been a collection of statues which were damaged and overthrown by the Persians when in 480 B.C. they sacked the city immediately before their defeat at Salamis. These sculptures bore plentiful and bright traces of their original paint. Other finds enabled students to draw up a complete record of Gk vase painting. Gk archaeologists have also made important finds at Epidaurus, where they excavated the theatre and the sanctuary of Asclepius. The latter affords a complete picture of a

spa at the end of the second century A.D. Valuable architectural and epigraphic evidence was brought to light at Thermos, whilst at Lycosura there has been unearthed a colossal group by Darphon (second century B.C.).

Successive Gk. administrations have welcomed the estab. of other national schools of archeology in Athens, where the Gers. cleared the celebrated theatre of Dionysus and part of the Dipylon cemetery. With their customary application and thoroughness the Gers. also made excavations at Olympia. They revealed the temples and other buildings of the Panhellenic sanctuary, and in doing so unearthed, among other reliefs, three priceless treasures: the pedimental sculptures of the temple of Zeus, the 'Winged Victory' by Paeonius, and, above all, the glorious Herms by Praxiteles, the only undoubted original from the hand of that master. Vases from the temple of Hera in Samos throw much light on the hist. of Ionic art; and important architectural finds were made in the is. of Aegina among the ruins of the temples of Aphrodite and Aphaea.

Of the more important work of the Fr. school mention must be made of that at Delphi, Delos, and Tegea. At Delphi a wealth of architectural remains and inscriptions was found, together with the marble frieze of the Cnidian treasury and the world-famous 'Bronze Charioteer.' Delos yielded the sanctuary of Apollo and the Hellenistic tn. whilst at Tegea were discovered sculptural fragments by Scopas (fourth century B.C.). The Amer. have concentrated their attention principally on sites at Corinth and Argos, but are now undertaking the formidable task of excavating the Agora at Athens.

In G. proper the most important work by the Brit. school has been done at Sparta. It has illuminated the whole hist. and culture of that renowned city. Brit. endeavour will, nevertheless, always be associated mainly with the revelation of Aegean culture in Crete (see MYCENAEAN AGE).

In 1873 Heinrich Schliemann, inspired by his study of Homer, unearthed some epoch-making remains at Hisarlik in Asia Minor. These bore all the evidence of being identical with the Homeric Ilion (Troy). Subsequently at Mycenae, Orchomenos, and Tiryns he brought to light traces of a high civilisation some 1500 years older than anything hitherto known. After his death his work was continued by Dorpfeld; but the full revelation of Aegean culture, its splendour and significance, was reserved to Sir Arthur Evans. Evans began his excavations at Knossus (see under CRETE) in 1905. By 1930 he had laid bare an immense palace whose structure and contents revealed a civilisation in the third millennium B.C., in presence of which our own stands humbled.

Archaeology, one of the most exacting and exact of sciences, has been hampered in the twentieth century by two world wars. In the first G. was not the victim of modern progress. In the second there

was bitter fighting both on the mainland and in Crete, and it was not to be hoped that the monuments of antiquity would survive unscathed. Generally speaking, however, those of the classical period escaped serious damage. The inevitable destruction was suffered principally by relics of the Byzantine and medieval periods. The Axis occupation of G. lasted from April 1941 to Oct. 1944; and during that time the work of the Ger. Referat fur Kunstschatz not only ensured the preservation of many irreplaceable treasures, but also led to some further excavations. The most interesting discovery at this time was an archaic marble sphinx now in the Kerameikos Museum at Athens. Irresponsible plundering by the ignorant was unavoidable, and for this it. troops were mainly responsible. When, however, we consider the turbulent hist. of G. the wonder is, not so much that we have only fragmentary remains of a splendid past, but that the irresistible forces of nature and the ungoverned fury of man have spared anything for the instruction and enjoyment of the present age.

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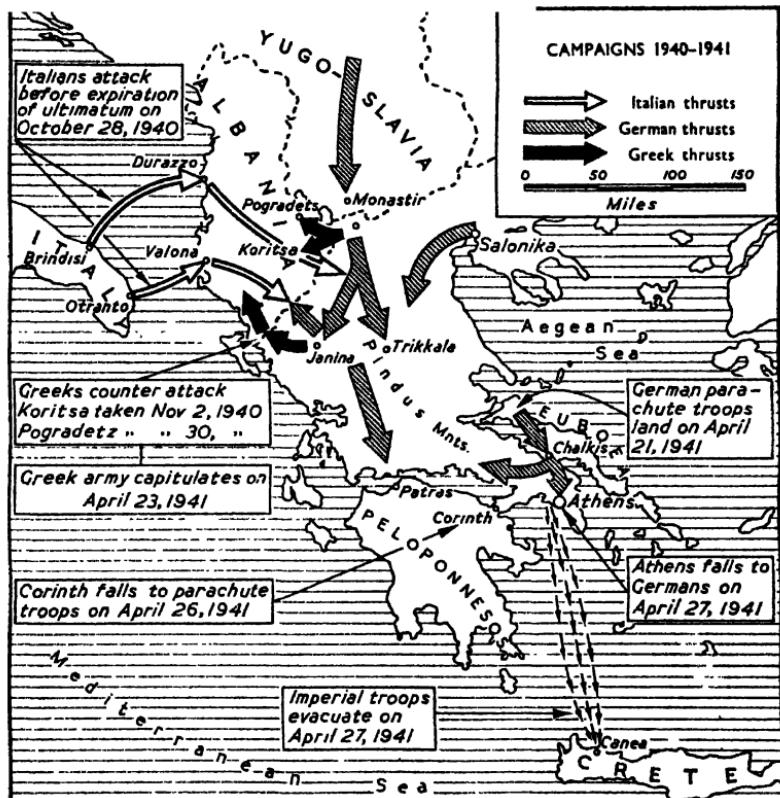
Greece, Second World War Campaign in (1941) (including Ger. invasion of Yugoslavia). The Italian Invasion of Greece.—Mussolini's invasion of G. was

undertaken in the hope of challenging Brit. sea-power in the Mediterranean, and the difficulties which met it from the very outset were due largely to that power. Time was pressing, for Graziani's Libyan army was making no real headway in its attack on Egypt. The duke of Aosta, commanding the It. forces in E. Africa, had seized Kassala with the possible end in view of an advance on Khartoum in co-operation with an attack on the Suez Canal by the Libyan army. But Graziani's ponderous advance was always checked by the threat to his left flank from the sea, and without Egean bases those in the Dodecanese Is. were useless as a *point d'appui* for an attack on the Brit. fleet at Alexandria. (See AFRICA, NORTH. CAMPAIGNS IN (SECOND WORLD WAR).—*Battle of the Western Desert* (Dec. 1940-Feb. 1941).) In attacking G. Mussolini underrated both Brit. sea-power and Gk. heroism, a major blunder in policy which soon led to resignations by those of the It. general staff who had not shared his bombastic confidence. On Oct. 28, 1940, the It. Gov. sent an ultimatum to G. accusing her of tolerating the use of her territorial waters and ports by the Brit. Navy and of permitting the organisation of the Brit. secret service in Gk. Is., and they therefore demanded the use of strategic points on Gk. ter. (Corfu, Crete, Epirus, and the port of Piraeus) for use against Britain. Before the ultimatum was due to expire It. forces from Albania attacked Gk. ter., meeting at once with strong resistance at all points.

The main strategy of the Its. in their thrust through the Pindus towards the Kalambos R., was to take Janina and Metsovo so as to open the way to Thessaly. But Gk. skill and valour, aided by familiarity with the difficult wooded and mountainous terrain, and by Brit. air and naval co-operation, thwarted the It. advance before it was more than a few m. over the frontier. Large-scale operations in the regions of Smolika and Gramos in the central Pindus resulted in the utter defeat of the 3rd Alpini Div., although reinforced by cavalry, Bersaglieri, and Fascist militia formations, all of which had long been mobilised in Albania. The Its. had sought to deliver a swift and decisive blow against the Gk. forces under Gen. Papagos by pinning them down with artillery fire and tanks and, at the same time, using the Alpinis to cut communications between the Gks. in the Pindus and Epirus sectors by rapid lunges towards Metsovo on the Epirus-Thessaly road. Early in these encounters light Gk. units withdrew after retarding the It. advance; but other Gk. detachments arrived on the scene by forced marches and launched a strong counter-attack, which led to fierce fighting in difficult conditions of weather and food supplies. The Gks. not only broke the thrust through the Pindus so decisively that the Its., fearing encirclement, fled in disorder, but began themselves to advance and, by Nov. 28, they had captured Ersek and thereby cut the main lateral communication. The Its. lost in these opera-

tions some 14,000 men in killed and some 5000 prisoners. Following this debacle Marshal Badoglio, It. commander-in-chief, appointed Gen. Soddu to the command of operations in Albania. Throughout this period Brit. planes had rendered valuable aid by bombing It. positions, aerodromes, troop concentrations, and other targets. The port area of Durazzo was completely gutted by

Koritsa, one of the two It. advance bases. The capture of Ersek had given them a new line of approach, and, though the Its. had the advantage of defensive positions in difficult country, the Gks. had crossed the watershed of the Morava massif by Nov. 21 and taken Koritsa itself. A few days later the victorious Gks. were in Muskopole and were advancing on Pogradets, which latter place



the R.A.F. and Valona was bombed severely. It. planes made raids on Patras, Larissa, Saloniaka, Corfu, Corinth, and other cities, but threats to Athens were lessened by Brit. raids on Stampalia is., the nearest It. air base to the Gk. cap. In the Epirus region the Its. held off impetuous Gk. attacks at Kalpaki until the pressure became too great and they were forced to evacuate the positions they had won at great cost. Meanwhile in the Florina region the Gks., who had crossed the Albanian frontier early in the campaign, were now steadily concentrating on the important position of

Permeti, a tn. 14 m. N.E. of Argyrokastro, fell on the last day of Nov. No great number of prisoners was taken in these later operations, which consisted essentially in innumerable small advances, after desperate resistance and prolonged pauses, followed by the fall of some tn. or vil. in a maze of broken, wooded, and ravined country, which gave its name to the issue of the protracted battle. Permeti, a tn. 14 m. N.E. of Argyrokastro, fell to them on Dec. 5; but Klisura, an equally important position in relation to Argyrokastro, held up the Gk. advance for a month. Argyrokastro was abandoned by the Its. on the fall of Permeti,

but the Gks. could only enter it after the capture of the Albanian port of Santa Quaranta, at the W. end of the lateral road. Argyrokastro was at the S. end of the two It. advance bases and, with its capture, the entire Gk. front was now out of G. and in Albania. To this remarkable success the Gks. owed not a little to the prompt and close co-operation of the R.A.F. and R.N. Tons of shells poured by Brit. ships into Valona proved that Brit. sea-power was a factor in the defence of G. One of the first results indeed of the hazardous It. attack on G. was the extension of Brit. sea-power westward, for, while G. remained neutral, Britain was denied bases in that country. Crete was also occupied as a naval base, thus giving the R.N. a strong grip on the middle Mediterranean. After the fall of Klisura and the small Albanian port of Chimala, 22 m. from Argyrokastro, the next Gk. objective was Tepelene. By now, however, It. reinforcements were reaching Gen. Cavallero, who had replaced Soddu in Albania and was now delivering a series of counter-attacks along the whole front. Late in Dec. a Gk. submarine sank some three It. troopships in the Adriatic, involving loss to the Its. of 1500 men of the 1st Alpine Regiment, besides all the artillery of a Tuscan regiment, and both Gk. and Brit. warships held up, though they could not stop the passage of all, troops and supplies.

It was now vital to Mussolini that the It. forces should stop the Gks. from further advances in the important Tepelene region. Hitler was now encroaching on all the Balkan countries, with the view of eventually attacking G. from the N., and Mussolini must somehow play for time. Moreover It. prestige demanded a successful reaction to the unbroken triumphs of the Gks. In desperation Mussolini ordered mass assaults on the Gk. positions. Heavy losses had been suffered by the Its., especially on March 10 in their bitter resistance to the Gk. advance on key positions in the Tepelene region, whole battalions being wiped out. Yet on the next day the It. counter-attacks assumed the character of a general offensive. But the Gks. held every position. Successive lines of It. infantry were mown down by machine-gun and artillery fire. On the succeeding day Mussolini flung every available man, gun, and tank into a series of attacks covering the whole Albanian front line from Lake Oridha to the Adriatic. But nowhere did the Its. make any impression on the Gk. lines. The main It. drive was on a 25-mile front E. and S. of Tepelene and is supposed to have been directed by Mussolini in person. Wave on wave of It. regulars and black-shirts were broken up and three It. divs. were annihilated. The ravines were littered with It. dead and wounded among the latter being Prof. Pellegrini, member of the Fascist Grand Council.

German Invasion of Yugoslavia and Greece.—British Expedition to Greece.—But this repulse of the Its. marked the zenith of Gk. resistance to invasion.

Preparations for a Ger. attack through Bulgaria and Yugoslavia were now in process of completion. Bulgaria's adherence to the Axis having been ratified by the Sobranje, the way was open to Germany to bring pressure to bear on the hapless and divided Yugoslav Gov. During this period Mr. Eden, Brit. foreign minister, and Gen. Dill, chief of the Imperial General Staff, were in Athens endeavouring to organise a Balkan bloc against Ger. aggression. It was hoped that, if Yugoslavia could be induced to resist a Ger. onslaught, Turkey might co-operate with G. and that, with the help of a Brit. expeditionary force drawn from Gen. Wavell's victorious army of the Nile, all these forces might suffice to throw back the Ger. invader. But Ger. military plans were on a much wider scale than was suspected by the Brit. Gov., for, even before the Ger. Gov. made their final demands on Yugoslavia, and while Brit. forces were being transported to G., Ger. troops and tanks were being borne across the Mediterranean from Sicily—which the Gers. had controlled for some time—to Tunis and thence, creeping along the coast, were disembarked at Tripoli. Troop-carrying planes were also supplementing the formidable force which, late in March, suddenly made its appearance S. of Benghazi (then in Brit. possession) with a view to the invasion of Egypt. (For antecedent events in Libya see AFRICA, NORTH, SECOND WORLD WAR CAMPAIGNS IN.—*Battle of the Western Desert, Dec. 1940–Feb. 1941.*) On March 25 the Yugoslav Gov., under the regent Prince Paul, concluded a pact with the Axis powers, but, immediately afterwards, a coup d'état was organised by Gen. Simovich, and the youthful King Peter II. assumed the reins of gov. There were popular rejoicings in Yugoslavia over this repudiation of Prince Paul's sacrifice of honour to expediency, but the consequences for the people were likely to be grave, for they were in no position to resist the onslaught of immense Ger. mechanised forces or to defend their cities against air attacks. Germany pursued the same tactics against Yugoslavia as had brought about the downfall of Poland and other countries. Belgrade was laid in ashes by bombers by way of foretaste of Ger. might. Brit., Australian, and New Zealand forces to the number of about 60,000 had, however, been landed in G. in mid March and had taken up strong positions in Macedonia, while heavy Ger. forces were massing in Bulgaria. Two Australian infantry brigades were holding the central position N. of the Vistriza R., the New Zealand troops were extended towards the coast on their right, while the Gks. held the line in the mountains on their left. The Gks. struck on April 6.

Their armies crossed the Bulgarian-Macedonian frontier at sev. points. They began to move up the Struma R. towards Salonika, across the Despoto Dagh in the direction of Drama, across the Rhodope Mts. on Xanto, and down the Maritsa R. The allies were under the

command of Gen. Wilson. His plan was to delay the enemy and to make his advance in Thrace and E. Macedonia as costly as possible. If too hard pressed he would fall back W. of the Vardar, even if that meant the loss of Salonika. On April 8 the Gers. captured Salonika, Skopje (Uskub), and Veles, and so directly menaced the Monastir Gap. In view of this threat a mixed allied force composed of artillery, an anti-tank gun unit, and a machine-gun battalion was posted to the S. of Florina. This force was attacked on April 9. The Gers. sent forward the Adolf Hitler Div., and, outnumbered by twenty to one, a Brit. armoured brigade sustained the brunt of this first tank and artillery attack. It was now evident that the enemy's immense superiority and weight of armour would soon overwhelm them and threaten the flank of Gen. Wilson's whole army. The allied force therefore withdrew to a mt. pass a little to the S. of their original position. The aim of the Gers. was to reach Mt. Olympus, and they now sent up two more divs. to support the crack troops already engaged and the three divs. resumed the onslaught on the Brit. line. Using a new weapon, a 105 cm. gun on tank t.a. w^s and moving under its own power, the Gers. poured thousands of tons of shells on the roads and defences. Following a tremendous bombardment from these guns and bombing from the air, tanks and infantry attacked the pass—the enemy infantry coming on in waves for twenty-seven hours. In this battle the Ger. losses were enormous; but after another four hours of furious fighting they carried the Kozani Pass. By now the Gers. had six divs. deployed N. of Larissa; Yugoslav resistance had collapsed, and they had entered the Monastir Gap and threatened to outflank the Gk. Army in Albania, that in Epirus being already in retreat. Further, the new Anzac line on Mt. Olympus was in danger. Accordingly, a general withdrawal began from Olympus to the Aliakmon R. and beyond in a N.W. direction.

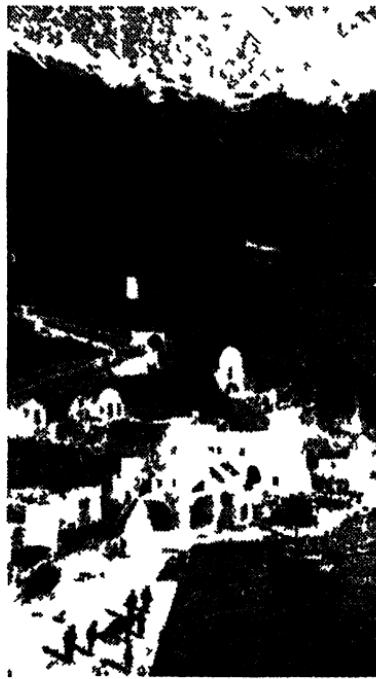
During the early stages of the Brit. withdrawal the Gers. were using two armoured divs. in addition to motorised infantry against the Allies, whose only armoured force was one Brit. brigade. Thus far the enemy had not shown his air strength over the front line, although he had carried out a series of raids on Gk. ports, especially the Piraeus. The Brit. troops saw the first dive-bombers in large numbers on April 13. That marked the opening of an air attack which grew daily more intense until a march of even a few m. on the road between Athos and the front line became a perilous adventure. There were too few Brit. aircraft to carry out regular defensive patrols over the Allies' area, though during the campaign what aircraft were available had delivered many attacks on Ger. lines of communication. Thus the allied troops had to endure bombing by the Gers. with impunity day after day, both on their positions and on their lines of communication. Ellesson, the vii. headquarters of

the Anzacs, was destroyed by bombs; Larissa, through which the road traffic passed to the front, was wrecked. A further withdrawal began on April 16 in face of the still increasing Ger. weight of numbers. This was the beginning of a movement which halted when the Anzacs occupied a line through Thermopylae in the rugged mountainous dist. at the foot of Mt. Parnassus—a line only 30 m. long as against the former 150-m. front on which the Eng., Anzac, and Gk. forces originally awaited the enemy. There was now the added danger of a Ger. attack from the W. and from the is. of Eubea to the S., so that it was necessary to place a small mobile force on the is. to prevent the landing of Ger. airborne troops. Australian observers looking down from the Bralos Pass on the plain of Thermopylae saw disheartening evidence of the Ger. superiority in equipment. Field guns were being landed from big Junkers planes, while other planes were fetching load after load of fresh troops. It was evident that the new line could not long be held by the Anzacs in spite of its natural strength. On the night of April 23 no fewer than 450 troop-carrying vehicles were seen moving towards the Anzac line obviously with a view to attacking it on the W. flank. Ger. troops had also landed on the N. coast of Eubea, thus presenting a threat from a different point. In these circumstances the Brit. force began yet a further withdrawal and by the end of the month some 43,000 troops had been evacuated from the Gk. mainland.

In this way ended the Brit. attempt to set up a kind of Torres Vedras resting on Mt. Olympus, and the reason why it failed was that under modern conditions this is impossible of achievement unless the defence has local air superiority. It was not the collapse of Yugoslav resistance or the Ger. numerical preponderance in tanks and infantry which caused the failure of the Allies' military plan, though no doubt these were all contributory factors. The campaign was in fact won by the Ger. Air Force. Yet originally they were faced with grave difficulties, such as the paucity of aerodromes in Bulgaria. These they overcame by months of patient work and, at the decisive moment, were able to put into the air at the strategic points a body of planes so large as to seem ubiquitous. Blasting strong points and gun positions in the mts., bombing tanks and transport along the narrow valleys, ceaselessly attacking communications, bases, dumps, aerodromes, ports, and shipping, they gave the Brit. and Gk. forces no respite all day. Could the Brit. forces have been aided by even 100 extra Hurricanes and Spitfires the whole issue of the campaign might have been reversed; but by reopening the Libyan front and threatening Egypt just when they did, the Gers. were able to reduce the Brit. margin of fighter-plane strength in the Balkans to a figure at which it ceased to affect the issue of the battle. Moreover, owing to the poor aerodrome facilities in Greece, no large R.A.F. force could have been sent.

In the final phases of their resistance to the combined invasion of their country by Germans and Italians the Greeks exhibited all their traditional courage against tremendous odds. Their valiant army in the Epirus was paralysed by the lack of anything but improvised transport, for when the Germans had taken Monastir and captured the vital pass to the south of the Epirus army they had in effect cut that army in two. Had the Greeks been equipped with modern motor transport they could have fallen back under cover of their artillery as did the British forces based on Mt Olympus and indeed might eventually have linked up with the westward spur of those forces. When it became obvious that the resistance of the Greek Army was at an end the Greek Government requested that the British Empire contingent should be withdrawn from Greece. The enemy having by repeated air attacks rendered impracticable the one available good port the Ierissos re-embarkation had to take place as at Dunkirk from open beaches against continual enemy pressure on land and heavy and successive attacks from the air. All services however played their part in the operation of re-embarkation with the result that nearly 80 per cent of the King and Anzac troops sent to Greece were safely evacuated to Egypt. The lighter fighting equipment was also taken away but the heavy equipment and transports were lost. Some 3000 men who reached the beaches were not evacuated. These included only a very small percentage of Australians. Also nearly 300 men were lost at sea one destroyer and one transport being sunk by the enemy. Two other transports were also sunk but these had embarked no troops. Australian casualties on land throughout the campaign were between 3000 and 4000. British casualties numbered about 6000. The enemy's losses will probably never be accurately known but they could hardly have been less than 50,000. The evacuation which was carried out under the generalship of Gen Sir Thomas Blamey, then deputy commander-in-chief Middle East, was unquestionably one of the most magnificent feats of arms in British history. Its final phase was full of exciting incidents and more than once the whole operation came within an ace of disaster. The New Zealand brigade which had helped to hold the position at Thermopylae was withdrawn in order to take up a position near the village of Kruckenek so as to cover the withdrawal of Anzac troops who had been holding the road to Samsun from Thermopylae. The New Zealanders held this precarious position for forty days the men lying close in gullies and among olive groves while German dive bombers searched for them ceaselessly. The enemy thinking he had sufficiently prepared the position sent forward infantry in lorries and there happened what had happened repeatedly for the previous weeks the British guns waited till the enemy reached a carefully considered stretch of road and then blew some fifty lorry loads to pieces. After that the brigade repaired to the Pelo-

ponnes for embarkation but the plan went amiss owing to the daring and well executed attack by 2000 German parachutists who descended in the isthmus of Corinth occupied the bridge across the canal and thus threatened to cut off the British troops in Attica from the Peloponnesus. These parachutists were dropped from quite low altitudes some explosive device being used to open the parachutes so that they alighted within a few seconds of leaving the plane. With each man were dropped



I N A

GREEK ARCHITECTURE THE ISLAND OF SANTORIN (THIRA)

The photograph is showing, also the upper town

other parachutists carrying machine guns so that within a few minutes of the attack being launched the whole area was being raked with heavy machine gun fire. But a warning was sent to the brigade headquarters and the New Zealanders escaped to another point on the coast of Attica. In this way ended the last adventure in the Balkans and the Greek defence. One lesson it taught was in the words of Gen Blamey, that 'men who were not fully mechanised could not hope to fight fully mechanised mechanised troops against whom a rifle was as useful as a bow and arrow'. See also CRIMEAN BATTLE OF (1911) For details of military operations

in 1944 see under EASTERN FRONT IN SECOND WORLD WAR.

Greek Archipelago, collection of is. in the Aegean Sea, belonging to Greece. There are some 300 of them, and they are divided into the following groups: Eubcea (pop. 179,500) and the Sporades, covering an area of 2216 sq. m., the chief is. being Skyros, and the Cyclades (pop. 147,000), covering 923 sq. m., These latter are of volcanic origin and number some 200, of which the most important are Naxos, Syra, Andros, Milos, Paros, and Santorin (Thira). The is. yield a large output of ore.

Greek Church, more correctly spoken of as E. Church, and described officially as the Holy Orthodox Catholic Apostolic E. Church, is the historical representative of the churches of the antec. E., and consists of fourteen self-governing churches, all of whom possess the same faith, the same bases of worship, and the same principles of government. These are (1) the Ecumenical Patriarchate of Constantinople, (2) the Patriarchate of Alexandria, (3) the Patriarchate of Antioch, (4) the Patriarchate of Jerusalem, (5) the Archiepiscopate of Cyprus, (6) the Church of Russia, (7) the Church of Greece, (8) the Metropolis of Carlovics, (9) the Church of Rumania, (10) the Church of Servia, (11) the Archiepiscopate of Montenegro, (12) the Metropolis of Hermannstadt, (13) the Metropolis of Bukovina and Dalmatia, (14) the Holy Monastery of Sinai. All these adopt the doctrinal decisions of the seven ecumenical councils, together with the canons of the Concilium Quinisextum or second Trullan Council (692), and entirely reject the pope's supremacy. They express their faith by the Creeds, except that they object to the 'Filioque' clause, saying that the Holy Ghost proceeds from God the Father alone, and believe that their communion is the only true Church of Christ. Moreover they differ from the Rom. Church in that they deny Purgatory and the doctrine of the Immaculate Conception of the Blessed Virgin.

As regards their rites they adopt the Julian calendar, beginning their eccles. year on Sept. 1, and have four great feasts, the most strictly kept being Lent, and a number of feasts, which they divide into three classes: great, middle, and lesser days. Easter is 'the feast,' then follow sixteen other great feasts, all of which relate to Our Lord or the Blessed Virgin. The middle feasts are those which relate to certain chief saints and apostles, and all the other days are the lesser feasts. The first Sunday of Lent is the feast of Orthodoxy, which was founded in memory of the restoration of the holy pictures after the second council of Nicen; the Sunday after Whit Sunday (our Trinity) is All Saints, and there are two All Saints' day's, the Saturdays before Sexagesima and Whit Sunday. The stronghold and centre of the whole worship is the liturgy, or eucharistic celebration, of which two types are used: that of Basil the Great, recited on fixed days, and that of Chrysostom, which is usual throughout the year. The liturgy of the pre-sanctified or the

'Dialogos' is only employed in Lent. Preaching of the divine word, which formed a part of the worship, has now disappeared, and is only to be found in some Russian churches. There are eleven chief service books, but no compendium like the Rom. breviary, and the service is conducted in 'Old Gk.' or 'Old Slavonic,' not in a 'dead' tongue. There is plenty of singing, though no instrumental music, and no images are allowed in churches except the crucifix and icons of the saints. The vestments are numerous and resemble in some respects those of the Church of Rome. Other characteristics of the E. Church are: they baptise by immersion, rarely hear confessions, give Holy Communion under both kinds, confirm by the priest immediately after baptism, ordain by laying on one hand only, crown the spouses at marriage, and anoint not only the sick but even people in good health.

The principles of church government are supported by the holy canons, by the fathers, and by the administrative laws of the emperors referring to the church and completing the canons. According to their principle the head of the Orthodox Church is Christ, and believers other than bishops are divided into two classes, *clergy* (consisting of archpriests, priests, and deacons) and *laity*. Monastic life, which is an important feature of the E. Church, is a single organism resting upon the monastic arrangements of Basil the Great, reduced to order by means of legal commands of eccles. and political legislation. The monks, except those of the imperial monasteries and those of the *stanopegia*, are subject to their local bishops. The centre of each church is the bishop, but the basis of administration is the synodal system, all questions on eccles. subjects and discipline being solved in regular or periodically convoked synods. And not only spiritual questions which affect eccles. life are regulated by church law, but also many relations of social life which are bound up closely with those of the church, such as marriage, divorce, etc. The estrangement between the E. and W. Churches was of gradual growth. In the early church there were three great bishops of importance, those of Rome, Alexandria, and Antioch, Rome having some sort of primacy and always vindicating the right of judging appeals against the other patriarchs. The rivalry between the churches seems to have begun when the seat of the empire was transferred from Rome to Constantinople. For this left the head of the Church of Romo free from the interference of the court and meddling statesmen; and this, added to the fact that the E. patriarchates were engaged in violent disputes, did much to increase his power. But it was not to be expected that the popo's pre-eminence would be acknowledged in the E., and to press it upon the patriarchs in times of irritation resulted in schism. Political jealousies aggravated the disputes, and at last the final break came in 1054 when Pope Leo IX. excommunicated

Cerularius and the whole of the E. Church. Though a temporary agreement was reached at the Council of Ferrara-Florence (1438-41) the separation was now final, and the ostensible cause was the introduction of the word 'Filioque' into the creed, and it is this addition which was and is still the permanent cause of separation. See R. L. Langford-James, *Dictionary of the Eastern Orthodox Church*, 1923; M. Constantinescu, *The Greek Orthodox Church*, 1931; F. Gavin, *Some Aspects of Contemporary Greek Orthodox Thought*, 1936; and J. M. Hussey, *Church and Learning in the Byzantine Empire*, 867-1185, 1937.

Greek Fire, name applied in general to the different kinds of liquid fire employed in the Middle Ages, but specifically used of a preparation of 'wet fire' invented by an architect named Callinicus, who lived in the reign of Constantine Pogonatus (648-85). He is said to have fled from Heliopolis in Syria to Constantinople, and his 'wet fire' was used at Cyzicus to set fire to the Saracen ships. Exactly what the mixture was is unknown, but Lt.-Col. H. W. L. Hime, after a careful study of all available evidence, decided that it differed from the other preparations of the kind in having quicklime as an ingredient which, when mixed with sulphur, naphtha, etc., took fire spontaneously when wetted.

Greely, Horace (1811-72), Amer. journalist and politician. In 1833, in partnership with a fellow workman, F. V. Story, he pub. the first cheap paper in New York, called the *Morning Post*. This paper failed, and after many adventures with scv. newspapers, G. estab. his reputation as an editor of the *Jessonian*, the *New Yorker*, and the *Log Cabin*. In 1841 he founded the *Tribune*, a paper which largely influenced public discussions of the time. He was among the first violently to advocate the emancipation of slaves; it is said that later he influenced Lincoln to issue his proclamation of emancipation. In the Republican Convention of 1860 he was a stout supporter of Lincoln and helped to secure his nomination as president. He pub. many works, among them *Hints towards Reforms* (1850); *History of the Struggle for Slavery Extension* (1856); and *Recollections of a Busy Life* (1868).

Greely, city of N. Colorado, U.S.A., and the cap. of Weld co. It is situated on a trib. of the S. Platte R. in a fertile valley, and is served by the Denver Pacific Railway. There is a trade in flour, lumber, and sugar. Agriculture and fruit growing are carried on, and there are rich coal-mines in the vicinity. Pop. 12,000.

Greely, Adolphus Washington (1811-1935), Amer. Arctic explorer. In 1881 he was appointed to command an Arctic expedition, with the purpose of establishing a chain of thirteen stations about the N. Polo for scientific and meteorological observations. He sailed from St. John's, Newfoundland, in the *Proteus*, with twenty-four men. A detachment of his expedition under Urainwood and Lockwood penetrated to a higher latitude than

any had attained before. G. and his companions suffered extraordinary hardships. Three separate relief expeditions were sent after him; the third, commanded by W. Scott Schley in 1884, arrived at Cape Sabine and found G. and six of his companions out of the twenty-four on the point of starvation; the rest had perished. His scientific records and a valuable collection of specimens were saved. Became major-general, 1906. He installed the first long-distance radio-telegraph. In Alaska, 1900-4. He pub. *Three Years of Arctic Service* (1885); *American Explorers* (1894); *Handbook of Arctic Discoveries* (1886); *Handbook of Polar Discoveries* (1909); *Handbook of Alaska* (1909); *True Tales of Arctic Heroism* (1912); and books on various climates. See G. W. Melville, *In the Lena Delta: the Greely Relief Expedition*, 1885, and W. Schley and J. Soley, *Rescue of Greely*, 1885.

Green, John Richard (1837-83), Eng. historian. He was b. at Oxford, and educated at Magdalen College School and at Jesus College, where he won an open scholarship. In 1860 he took holy orders and became a curate in London. In 1866 he was appointed incumbent of St. Philip's, Stepney. He studied hist., and at this time wrote frequently for the *Saturday Review*. His health broke down; his views on the teaching of the Church of England changed, and he retired from the church and accepted the post of librarian at Lambeth. He then devoted himself entirely to hist. In 1874 he pub. his *Short History of the English People*, a brilliant picture of the social and economic evolution of Eng. life, in contrast to the usual political histories. This became exceedingly popular. His style is vivid, interesting, and accurate, and he made the reading of hist. a pleasure to thousands who had formerly regarded it as tedious and dry. In 1882 he wrote the *Making of England*, and in 1883 *The Conquest of England*. After his death his wife finished the last-named book. It has been said that *Robert Elsmere*, by Mrs. Humphrey Ward, is partly a portrait of him. Mrs. G. (Alice Stopford) helped considerably in her husband's work and has also written valuable historical works, especially relating to the early hist. of Ireland. See C. Tait, *Analysis of English History based on Green's "Short History of the English People"*, 1897, and J. (Viscount) Bryce, *Studies in Contemporary Biography*, 1903.

Green, Thomas Hill (1830-82), Eng. philosopher, b. at Birkin in Yorkshire, of which his father was rector; educated at Rugby and at Balliol College, Oxford; elected fellow, 1860. He spent his life in teaching, chiefly as lecturer on philosophy and as Whyte's prof. of moral philosophy, from 1878 till his death. His influence on the philosophy school at Oxford, both during his life and in succeeding years, has been great, and has stamped the final honours examination of Literae Humaniores with his Hegelian and Kantian idealism. His pub. works were few; apart from his introduction to the standard ed. of Hume (T. H. Green and T. H. Grove), his philosophy is stated in the

Prolegomena to Ethics (1833), ed. by H. C. Bradley, and the *Principles of Political Obligation* (1895); his collected works were pub. and ed., with memoir, in three vols., by R. L. Nettleship. See also W. H. Fairbrother, *Philosophy of T. H. Green*, 1898; H. Sidgwick, *Green's Ethics*, 1902; J. (Viscount) Bryce, *Studies in Contemporary Biography*, 1903; and J. H. Muirhead, *The Service of the State, Four Lectures on the Philosophy of T. H. Green*, 1908.

Green, William Edward, see FRIESE-GREENE.

Greenaway, Kate (1846-1901), Eng. artist and illustrator of books, b. in London. Her father was John G., an engraver and draughtsman. She studied at S. Kensington and at the Slade schools. In 1868 she first exhibited water-colour drawings at the Dudley Gallery, London. In 1873 she began to illustrate for *Little Folks*, and commenced her series of Christmas cards for Marcus Ward; they were full of quaint beauty and charm and became extremely popular. In 1877 she began to draw for the *Illustrated London News*. The charming freshness of her illustrations in her books, one of which, *Under the Window* (1879), sold to the extent of 150,000 copies, made her famous. Her drawings of children, dressed in the style of the early nineteenth century, are full of artistic grace and delicate quaintness. Among her best known illustrated books are *A Birthday Party for Children*, *The Pied Piper of Hamelin*, *Mother Goose*, and *Little Ann*. See M. H. Spielmann and G. S. Layard, *Kate Greenaway*, 1905.

Greenback Party, Amer. political party formed in 1874 which advocated that the circulation of notes by state and national banks should be prohibited, that greenbacks alone should be circulated, and that the whole of the U.S. debt should be paid in greenbacks. It ceased to exist as a party in 1884.

Greenbacks, popular name of the legal tender circulating notes of the U.S.A., so called because the back is printed in green ink. Treasury notes were first issued of necessity to provide funds for the civil war in 1862; there were three of these issues, the first in Feb., the next in July, 1862, and the last in March 1863. The notes soon depreciated in value and fell to 35 cents on the dollar. An Act of March 1878, restoring specie payments, had the effect of fixing the amount then current as the regular circulation, and G. have never fallen below par.

Green Bay: 1. City of Wisconsin, U.S.A., and cap. of Brown co., situated at the head of G. B., near the mouth of Fox R. It is 114 m. N. of Milwaukee and 240 m. N. of Chicago. It is a centre of the lumber trade and has an export trade in shingles, staves, etc. There are ironworks, flour-mills, breweries, etc., and the fisheries are important. There is a good harbour and a steamboat service. Pop. 46,200. 2. Large arm of Lake Michigan, upon which the above city stands. It is 100 m. long and from 15 to 35 m. wide.

Greenburgh, township and vil. of New

York, U.S.A., in Westchester co., situated on the Hudson R., 5½ m. from Yonkers. Pop. 36,000.

Greenbush, or East Albany, tn. of New York, U.S.A., situated in Rensselaer co., on the Hudson R. It is opposite Albany, with which it is connected by a railway bridge. There are sawmills, a tannery, colour works, and manufs. of tools. Pop. 7300.

Greenbushes, post tn. of W. Australia, and also one of the chief tin-bearing dists. of W. Australia.

Green Chafer, see Rose BEETLE.

Green Cloth, Board of, committee of the Brit. royal household, taking its name from a green-covered table at which it has long been a custom for the board to sit when transacting business, which is to examine and pass all the household accounts. At one time it also had the power to punish offenders within what was known as the 'verge of jurisdiction,' or the precincts of the palace. The board is presided over by the lord steward, and consists of the leading officials of the household.

Greencod, Coal-fish, or Saithe, or *Gadus vivens*, is a member of the cod-fish family. It is carnivorous and is itself eaten by man, and on the W. coast of Scotland is often caught in great abundance, as it preys on herring. The fish inhabits the seas between the Arctic and the Mediterranean, and is sometimes known as coal-fish from the dark colour of its back.

Greene, Graham (b. 1904), Eng. novelist and editor. He began as a writer of thrillers, with an accent on the character-study of the crook, notably in *Stamboul Train* (1932) and *Brighton Rock* (1938). Later he wrote novels concerned with inner conflict between right and wrong. *The Power and the Glory* (1940) and *The Heart of the Matter* (1948) proving especially popular. His work has been further popularised by the films of *Brighton Rock* and *The Fallen Idol*. He has also been a publisher.

Greene, Harry Plunket (1865-1936), Brit. singer, b. in Dublin; studied at Dublin, Stuttgart, Florence, and London. Was highly successful, both in Europe and in America.

Greene, Maurice (1693-1755), Eng. musical composer, b. in London. He began his musical career as a chorister in St. Paul's Cathedral, becoming in 1718 the cathedral organist. Nine years later he was appointed organist at the Chapel Royal, and in 1730 was elected to the chair of music at the univ. of Cambridge. He was the composer of a great deal of church music, of which the best known works are *Forty Select Anthems* and *Catches and Canons for Three or Four Voices*. He also wrote sev. oratorios, a masque, and a pastoral opera.

Greene, Nathaniel (1742-86), Amer. general, b. at Potowomut in the township of Warwick, Rhode Is. He came of Quaker stock, and was not originally intended for the army, but in 1775, having been for a year in the militia, he was given the command of the Rhode Is. contingent of troops, and joined the Amer. forces at

Cambridge. His able generalship won him Washington's confidence and his promotion was rapid. He took part in many successful engagements, distinguishing himself especially at Trenton and Princeton. In 1780 he was given the command of the S. army, which was opposed to a far superior force under Lord Cornwallis. His masterly strategy during the retreat from Catwaba to the Dan was such that it enabled him not only to survive the two defeats of Guilford Court House (March 1781) and Hobkirk Hill the following month, but eventually to win the victory of Eutaw Springs and drive the Brit. out of S. Carolina. At the end of the campaign he was offered the post of secretary for war, but he refused, and in 1785 he settled on his Georgia estate, Mulberry Grove, where he d. the following year. See *Life of Nathaniel Greene*, by his grandson, George W. Greene (3 vols.), 1867-71, and *Biography* (New York), 1893, by Brig.-Gen. F. V. Greene in the Great Commander series.

Greene, Robert (1560-92), Eng. dramatist and writer, b. at Norwich; it is not certain who his father was. In 1573 he went to St. John's College, Cambridge, as a sizar, where he took his B.A., and in 1583 he became an M.A. from Clare Hall. According to his own account, his life at the univ. was utterly disreputable. In 1585 he married, and deserted his wife after the birth of their child; then he went to London, where he soon became famous as a playwright (all his plays were pub. posthumously) and writer of love fantasies. Before his death he became the slave of every kind of vice and quite dependent on the charity of very poor persons. The story of his death is disgusting yet pitiful. One of his pamphlets, entitled *A Groat's worth of Wit bought with a Million of Repentance* (1592), appears to hold an attack on Shakespeare, part of the quotation being "Is in his own conceit the only Shakescene in a country." Among his other writings are *Orlando Furioso* (1584) and *The Honourable History of Friar Baron and Friar Bungay* (1594). His *Pandosto, the Triumph of Time* (1588) formed the foundation for Shakespeare's *Winter's Tale*. In 1599 was produced his *Alphonsus, King of Aragon* and *George-a-Grene, the Pinner of Wakefield*. His works are filled with wit and charming romance and contain much good verse. G. woed popular taste in imitations of Marlowe, but so awkwardly that his *Alphonsus* and *Orlando Furioso* seem like parodies. His comedies are full of magicians, klug-, and courtiers worked into unity by a background of romance. His *Friar Bacon* and *James IV*. If a far cry from Shakespeare at all events point the way to *A Midsummer Night's Dream*. See C. Collins, *Plays and Poems*, with introduction (2 vols.), 1905.

Green Earth, mixture of magnesian ferrous, and aluminium silicates of uncertain composition found in cavities and veins of basaltic igneous rocks. It is evidently a secondary product resulting from altered pyroxene, amphibole, etc., and may resemble serpentine or chlorite.

Glaucosite is a form of it met with in some of the sandstone of the Cretaceous system.

Greenfield, city of Massachusetts, U.S.A., and the cap. of Franklin co. It is situated near the R. Connecticut, 34 m. N. of Springfield. There are manufacs. of cutlery, tools, and machinery. Pop. 15,600.

Greenfinch, or **Green Linnet** (*Ligurinus*, or *Chloris*), common European bird, to be found also in parts of Asia and in New Zealand; it is also an occasional visitor to Palestine. It abounds in the Brit. Isles, having a preference for wooded districts. The cock is one of the brightest coloured of the common Brit. birds, its plumage being of a light yellowish-green, with the breast of yellow.

Greenfly, see *APHIDE*.

Greengage, name given to a certain kind of small round plum, grown especially for dessert. It is less hardy than some kinds, and requires shelter and a good deal of care in cultivation, which follows the same lines as those of the plum.

Greenheart, or **Bibiru**, the popular name given to the species of Lauraceæ technically known as *Nectandra Rodwei*. It is a native of America, and is a tree which yields a useful timber; the bark is employed for medicinal purposes. The term of G. is also applied to *Calyptranthes chalybea*, a species of Myrtaceæ, and to *Colubrina ferruginea*, a species of Rhamnaceæ.

Greenhithe, eccles. par. and vil. of N.W. Kent, England, situated on the Thames, 2½ m. N.E. of Dartford. It was the starting point of the ill-fated Franklin expedition in 1845. There are chalk quarries, a trade in lime and cement, brick-fields, and market gardens. Ingress Abbey, wh. h formerly belonged to Dartford Abbey, was occupied by Queen Caroline. Pop. 3,500.

Greenhouse, see *Hothouse*.

Green Howards, see *YORKSHIRE IRREGIMENT*.

Greenland, is. continent belonging to Denmark, the larger part of which lies within the Arctic circle. It is bounded on the E. by the N. Atlantic and the Norwegian and G. seas, with the Denmark Strait dividing it from Iceland. On the W. Davis Strait and Baffin Bay separate G. from Baffin Land. Cape Farewell is the most southerly point, 59° 45' N. The length of G. is about 1650 m., and at the northerly part, where it is widest, the breadth is about 700 m. Its total area is about 830,000 sq. m. of which only about 50,000 are free from ice. The interior is covered with a vast glacier of ice and snow, deep enough to bury the mts. and fill the valleys. This inland stretch of ice rises to 9000 ft. and more, leaving only occasional isolated rocks uncovered. The glacier slopes gradually down to the coast, discharging icebergs, which float down the Atlantic and travel S. of Newfoundland. The Humboldt Glacier on the N.W. coast is the largest in the world, having a breadth, where it reaches the sea, of 60 m. The coast is indented with deep fjords, and numerous small ls. lie close to the land. Of these

Disco is the largest, having an area of 3005 sq. m.; native iron is found here, also coal of a poor quality. Graphite is also mined. The only other mineral of any economic importance is cryolite, found and worked at Ivigtut in the Arsuk fjord on the S.W. coast. The climate varies a great deal from bright sunshine to dense snow and fog; in the warmest month, July, the temp. is about 46° F., and in the coldest month, Jan., it may drop to -36° F. and below, while inland it may descend to -90° F. The climate on the E. coast is more Arctic than on the W., and the land



I. W. Hutchinson

THE PARSONAGE, JACOBSHAVN

more deeply covered with snow. The plant life of G. is of the Arctic type. There are no forests; the dwarf willow and birch are the chief trees; flowering mosses flourish, and the yellow poppy, certain saxifrages, a heath, a rhododendron, an azalea, harebells, campions, and numerous other flowers blossom abundantly in some dists. during the two months of summer. Gardening is difficult, but in the S. a few vegetables are grown, chiefly radishes and turnips. The chief wild animals are the white polar wolf, the polar bear, the polar fox, the Arctic hare; and the reindeer, although hunted to extinction in the S., still abounds in the more northerly dists. There are sev. varieties of birds, among them the eider-duck, guillemot, and the ptarmigan. The fisheries are very important, including cod, caplin, halibut, sea trout, etc. The whaling industry, though not as flourishing as formerly, still

continues, and the sealing is very important. Narwhal and walruses are also caught. The pop. in 1945 numbered 21,384 (Europeans 569; natives, 20,815). The trade is only with Denmark, it being a monopoly of the Dan. crown since 1774. The prin. exports, which in 1939 amounted to 8,461,000 kroner, are seal and whale oil, fox, bear, reindeer, and seal skins, elderdown, feathers, and cryolite. The imports from Denmark were valued at 3,537,000 kroner.

For purposes of government the country is divided into two inspectorates, Godthaab and Godhavn, ruled by two governors responsible to the board at Copenhagen. Each inspectorate is divided into dists. These dists. have a chief settlement and various outlying hunting stations, of which there are about sixty. Trading is carried out on a system of the gov., giving low prices for the produce, and selling European necessities at the smallest possible rate. The inspectors are magistrates as well as trade superintendents, but crime is very rare. The Dan. inhab. usually live in houses built of imported wood, covered with pitch, while the Eskimos dwell in huts built of stone and turf, entered by a little tunnel. Godhavn, on Disco Is., about half-way up the W. coast, is the cap., but Sydrevnen in the far S., with a pop. of 901, is the largest settlement. Other settlements are Upernivik, which until Knud Rasmussen founded a trading station at Thule (Kap York) was the most northerly vil. in the world, Umanak, Jacobshavn, and Christianshaab, all within the Arctic circle, Sukkertoppen, Godthaab, Frederikshaab, Ivigtut, and Julianehaab. There is only one settlement, Angmagssalik, on the bleak E. shore.

The hist. of G., as we know it, began in 982, when the Norwegian Eric the Red sailed from Iceland to find the country which one Gunnbjorn declared he had seen and stayed at. Eric discovered the country and called it G., hoping by this name to persuade people to colonise there; two colonies were formed, one called Osterbygd, in the dist. of Julianehaab, and another in the dist. of Godthaab. Remains of these Northmen and numerous ruins have been found. Christianity was introduced in A.D. 1000 by Leif Ericsson; the colonists built twelve churches and a monastery. For four centuries the Norse colony thrived, but by the beginning of the fifteenth century, intercourse with the motherland, owing to increased Arctic ice and to epidemics and civil disturbances in Scandinavia, ceased entirely. The fate of the unfortunate colonists is unknown, but when in 1585 John Davies visited G., he found it to be inhabited only by Eskimos. It was recolonised early in the eighteenth century by Hans Egede. From 1261 to 1814 G. belonged to Norway, after which it became D.^r. Sev. Arctic explorers have visited G. The first person to give a trustworthy account of the coast was the Scottish whaler, Capt. Wm. Scoresby, in 1822. After this sev. other expeditions of exploration were made by

Gers, Danes, and Englishmen. Nansen, in 1888, travelled along a part of the coast. In 1905 the duke of Orleans's expedition discovered that the furthest N.E. point was an is. In 1930-31 two exploration parties, one Eng. under Watkins and a Ger., one under Dr. Wagener, wintered in G. A party of the Oxford Univ. Exploration Club left for G. in 1938 to carry out meteorological and glaciological work. In June 1930 a party of Norwegian sea-captains proclaimed the 'annexation' of part of the N.E. coastal region. Denmark formally took control of Thule (pop. 300) in 1937, for, although Denmark exercised suzerainty over the whole of G., the little settlement of Thule had been in a distinctive position since its discovery by Rasmussen, who set up there a sort of local gov. through a 'Council of Hunters.'

F.N.A.
ESKIMO WOMEN

The very extensive harbour of Feringehavn, 32 m. S. of the cap. of N. G., was opened up in the same year. By a defence agreement, signed on April 9, 1941, the U.S. Gov., in order to protect the *status quo* in the W. hemisphere, acquired the right to construct and operate landing fields, seaplane facilities, and radio and meteorological installations. The agreement explicitly recognises the sovereign rights of Denmark in G. See H. Egede, *Description of Greenland*, 1740; H. Kunk, *Danish Greenland*, 1877; H. Mohn and F. Nansen, *The First Crossing of Greenland*, 1890; Knud Rasmussen, *Greenland by the Polar Sea*, 1921; J. W. Billby, *Among Unknown Eskimos*, 1923; M. Vahl, *Greenland*, 1928; Isobel W. Hutchison, *On Greenland's Closed Shore*, 1930; I. N. Krabbe, *Greenland, its Nature, Inhabitants, and History*, 1930; and V. Stefansson, *Greenland* (New York), 1942.

Greenland Sea, that part of the Arctic Ocean lying between Spitsbergen on the N. and Greenland and Jan Mayen on the S. In places it is 1,500 fathoms in depth, and its greatest width, between Norway and Greenland, is 700 m. The temp. is variable.

Greenlaw, small tn. of S. Berwickshire, Scotland, on the Blackadder. Anti-quarian remains have been found, in-

cluding a camp and sev. cairns. The chief manufs. are woollens and agro. implements. Pop. 909.

Greenlet Island, is. of Canada, situated in the strait of Belle Isle. It was proposed that here should be the landing-place of a Canadian Atlantic cable, extending from Clew Bay in Ireland.

Green Linnet, see GREENFINCH.

Green Mountains, range of mts. in Vermont, U.S.A., a part of the Appalachian system. Highest peak, Mt. Mansfield.

'Green Mountain State,' see VERMONT.

Greenock, municipal and police burgh and seaport tn. in Renfrewshire, Scotland. It is situated on the S. bank of the Clyde and is 23 m. by rail W. of Glasgow. The tn. stretches along the water for nearly 4 m. and the harbour works are extensive, including the Victoria and Albert harbours, the James Watt dock, and the Garvel graving dock. The tn. possesses some fine public buildings, notably the municipal buildings, in the style of the It. Renaissance, with a tower 265 ft. high; the co. buildings (1867), which also possess a tower 112 ft. high; the custom house (1818) in classic style, with Doric portico; the Watt Institution, founded in 1837, containing the public library (1783); the Watt scientific library, founded by the inventor in 1816; and the statue of James Watt by Sir Francis Chantrey. The Watt Engineering, Navigation, and Wireless Telegraphy School stands on the site of the inventor's bp. adjacent to the municipal buildings. The N. par. church, a Gothic building dating from 1391, and re-erected at the Esplanade, contains windows by Wm. Morris, Burne-Jones, and Rossetti. The churchyard was the resting place of Burns's 'Highland Mary,' whose remains were reinterred in G. cemetery and the monument also removed there. The grave of John Galt, the novelist, is in the Inverskip Street burying ground. The chief industries are shipbuilding, marine engineering, sugar refining, rope spinning, cask and case making, manuf. of chemicals, worsted spinning and knitting factory, and other industries. G. is divided into nine wards, has a tn. council of twenty-seven members, and returns one member to Parliament. From 1940 until 1945 the Free Fr. naval base was at G. and there is a memorial, which is a prominent landmark from the estuary, at the Lyle Road, to the men of the Free Fr. forces who gave their lives in the battle of the Atlantic. The tn. was subjected to aerial attack by the enemy, the worst being on the nights of 5th-6th and 6th-7th May, 1941, when much property was destroyed and many lives lost. Pop. 79,000.

Greenore, watering place of Co. Louth, Ireland, situated on Carlingford Lough. It has a steam-packet service and golf links. G. affords beautiful scenery, and has a raised beach, about 10 ft. above sea level. Pop. 300.

Greenough, George Bellas (1778-1855), Eng. geologist. He was one of those who founded the Geological Society of London, of which he was the first president. He pub. *A Critical Examination*

of the *First Principles of Geology* (1819) and the famous *Geological Map of England and Wales*, in six sheets, and a geological map of India.

Greenough, Horatio (1805-52), Amer. sculptor, b. at Boston. He evinced a taste for art while still at Harvard, and designed the Bunker Hill monument. In 1825 he went to Rome and became a pupil of Thorwaldsen. The Amer. Gov. selected him to execute the colossal statue of Washington which was unveiled in 1843 in the city of that name, and later he executed a group representing the struggle between the Anglo-Saxon and Indian races, 'The Rescue.' The gallery of the Boston Athenaeum contains a bust of Lafayette by him, and the 'Medora' and 'Venus Victrix.' See H. T. Tuckerman, *Memoir of Horatio Greenough* (New York), 1853, and letters ed. by F. H. Greenough, 1887.

Green Point, suburb of Cape Town, Cape Prov., S. Africa.

Green River: 1. riv. of the U.S.A. It forms one of the two great streams which ultimately form the Colorado. It rises in the Wind R. Mts. in W. Wyoming and joins the R. Grand. It has a total length of about 720 m. and flows through deep canyons, which cut out for itself through the rocks of the Uinta Mts. 2. Another Amer. riv., which is the largest trib. stream of the Ohio. It rises in Kentucky and joins the Ohio near Evansville, Indiana. Length 300 m.

Greenroom, waiting-room built close to the stage of a theatre for the use of actors and actresses during the intervals of a play. Actors suffer from 'stage glare' caused by the artificial lighting of a theatre, and the colour green is a good antidote to this affection of the eyes, therefore the waiting-room walls were coloured green; hence the name. See *The Green Room Book* (a directory of prominent people connected with the stage, pub. annually), also *The Secret History of the Greenrooms . . . in the Three Large Theatres, 1790-93* (vol. I, Drury Lane; vol. II, Covent Garden; vol. III, The Haymarket).

Greensand, so named from the colour of some of its beds due to the presence of glauconite, consists largely of the internal casts of the chambers of *Fornimifera*. It was divided by Webster (1824) into Upper G. and Lower G.; the former in the Upper Cretaceous system (*q.v.*) and the latter in the Lower, being separated from one another by the Gault. The terms are unsatisfactory, and the name *Vertonian* is now frequently applied to the Lower, which is more often yellow or brown than green, while the Upper with Gault forms the *Silurian*. The Lower G. can be traced in England at intervals from the Isle of Wight, through Dorsetshire and Oxfordshire, to Lincolnshire, but it largely centres on the Weald. The Upper G. in England is deposited on a V-shaped area from Kent and Sussex to Dorsetshire, back to Norfolk, with a continuation in Lincolnshire and Yorkshire. Many local names exist for G. In Surrey the deposit is known as firestone and hearth-

stone, in Hampshire as malmstone. The scythestones and whetstones known as Devonshire bats come from the Upper G., while the concretions of carbonate of lime from the Lower are used in the manuf. of cement. Other products are glass, sand and Fuller's earth. In the Weald important correlations exist between these deposits and local scenery, vil. sites, and industries.

Greensboro, Amer. city of N. Carolina, U.S.A., situated in Guilford co., of which it is the cap. There are three colleges here, viz. G. Female College (1846), Bennett College, and the State Agric. College. The surrounding country produces tobacco and fruit, and the tn. is noted for its cotton-mills and blast furnaces. There are also lumber mills, terra-cotta works, and manufs. of machinery. Pop. 59,000.

Greensburg: 1. City in the co. of Westmoreland, Pennsylvania, U.S.A., situated in the centre of a coal-mining dist., and is slightly less than 30 m. E.N.E. of Pittsburgh. It manufs. glass, iron, and steel. Pop. 16,000. 2. Amer. city in Decatur co., Indiana, U.S.A., 47 m. S.E. of Indianapolis. Its chief industries are flour-milling, quarrying, and lumber. It is a farming and stock dist. Pop. 8000.

Greenshank (*Totanus canescens*), bird of greenish colour, which belongs to the sandpiper class. It is migratory, leaving Great Britain at the end of July and reappearing at the end of April. It is found principally in the N. and W. of Scotland.

Green Sickness, see CHLOROSIS.

Greenstone, name formerly used quite generally for weathered igneous rocks, e.g. basalt, gabbro, diabase, etc., in which a development of chlorite or serpentine had caused them to become dark green. The term has now been replaced by more definite names dependent on actual analyses. See GREEN EARTH.

Greenville: 1. City and co. seat of Washington co., Mississippi, U.S.A., on the Mississippi R., 76 m. from Vicksburg. It is in the centre of a large cotton-producing region, and its industries are largely connected with that staple. Pop. 15,000. 2. City and co. seat of Darke co., Ohio, U.S.A., on G. Creek, 35 m. N.W. of Dayton. It is the trade centre for a large and fertile agric. dist., producing cereals and tobacco. Here Gen. Wayne concluded the treaty of G. with the Indians, 1795. Pop. 7000. 3. Parl. bor. in Mercer co., Pennsylvania, U.S.A., about 52 m. S.E. of Erie. The trade of the tn. is considerable, as it is the commercial centre of a large section of Mercer co. and nearby places in Ohio. The coal, oil-fields, and stone quarries in the vicinity add to its industries. Pop. 9000. 4. City and co. seat of G. co., S. Carolina, U.S.A., 100 m. N.W. of Columbia. It is in the centre of an extensive cotton-growing and cotton-manufacturing dist., and its chief industry is therefore connected with that staple, but it has also carriage and wagon works, ironworks, and flour-mills. Pop. 36,000. 5. City and co. seat of Hunt co., Texas, U.S.A., about 50 m. N.E. of Dallas. It is a trade centre for a rich agric. dist., and

is also an important cotton market. Pop. 12,407.

Greenwell, Dora (1821-82), Eng. writer. She became known as an essayist and a writer of religious poetry. She was compared, because of her religious feeling and expression, with Thomas à Kempis and Fénelon. In 1869 she pub. *Carmina Crucis*, and in 1871 *Collinea Crucis*. She pub. her essays (1866) and a *Life of Lacordaire* (1867).

Greenwich, Duke of, see CAMPBELL, JOHN.

Greenwich: 1. Parl. bor. in the co. of London, situated on the Thames some 4 m. S.E. of the city of London. It is situated on the S. side of the riv. and there

though since 1873 a Royal Naval college, occupies the site of an anc. royal palace called G. House, which was a favourite royal residence as early as 1300. It was, however, granted by Henry V. to Thomas Beaufort, duke of Exeter, and in time passed to Humphrey, duke of Gloucester, who gave it the name of 'Placentia.' It reverted to the crown in 1447 at his death, and was enlarged by Edward IV., by Henry VIII., who made it one of his prin. residences, by James I.; and by Charles I., who built the 'Queen's House' for Henrietta Maria. It was occupied by the Protector during the commonwealth, and after the restoration by Charles II., who had it pulled down. It, however, started to



GREENWICH HOSPITAL
1 in an old engraving.

are two tunnels under the riv. which connect it with the N. side. One is for foot passengers, and the other, called the Blackwall Tunnel, is used by vehicular traffic passing to the India docks. The tn. is celebrated for its hospital and for the observatory, now (1949) in process of removal to Hurstmonceux, Sussex. The observatory is built on the point through which passes the first meridian of time, which is telegraphed each day to all parts of Great Britain, is the standard time. The observatory stands in lat. 51° 21' 38" N. The bor. returns one member to Parliament. Pop. 72,600.

2. Amer. tn., Fairfield co., Connecticut, U.S.A. situated on Long Is. Sound, about 30 m. N.E. of New York. It was settled in 1640, is a well-known health resort, and contains the villas of many wealthy New York business men. Putnam Cottage, the headquarters of Gen. Putnam in 1778-79, is situated here. There are paper mills and foundries. Pop. 35,500.

Greenwich Hospital, as it is still called,

erect another building, which was granted, in the reign of William III., as an asylum for disabled seamen of the navy. The most notable rooms of the hospital are a chapel with rich marble-carved work, and a painting by West of the shipwreck of St. Paul, and a spacious hall, 108 ft long and 56 ft broad, which is decorated with representations of sea fights, statues, portraits, and reliefs of naval heroes. Formerly 2700 retired seamen were boarded in the hospital, but now the building is utilised for the Royal Naval College, the greater number of the seamen residing with their friends and receiving pensions for personal use. The management of the revenue is vested in commissioners under the Admiralty.

Greenwich Royal Naval College, naval school estab. by the Admiralty for the purpose of giving special technical training to intending officers of the British marine services. It occupies the greater part of the Royal Hospital at G. The college is open to students for the navy. The Royal Marines, the Indian Marines,

the Merchant Service, and all sides of naval education are cultivated. A course of naval construction is taken; the subalterns of the Royal Marines take this course here as part of their qualifying training.

Greenwood, Frederick (1830-1909), Eng. journalist, b. at London. He began life in a printing house, but his contributions to various periodicals gained him a reputation, and in 1862 he became, with G. H. Lewes, joint editor of the *Cornhill*, and sole editor in 1861. In this paper he pub. his novel *Margaret Denzil's History*. In 1865 he became first editor of the *Pall Mall Gazette*, which soon acquired a powerful influence upon Conservative politics. It was due to G. that Great Britain bought the Khedive's shares in the Suez Canal (1875). In 1880 when the *Pall Mall* changed into the hands of a Liberal proprietor, G. resigned and accepted the editorship of a new paper, the *St. James's Gazette*, over which he ruled for eight years. In 1891 he launched the *Anti-Jacobin*, which, however, was unsuccessful. He continued to exercise his influence in the political sphere by contributing to such papers as the *Westminster Gazette*, *Cornhill*, *Blackwood*, *Pall Mall*, etc. His chief publs. are *The Lord*, *Iericon* (1893) and *Imagination in Dreams* (1891). See memoir in *Blackwood's Magazine*, Jan. 1910.

Greenwood: 1. Co. tn. of the co. of the same name in S. Carolina, U.S.A. Its chief manufus. are cotton and cotton-seed oil. There is a military institute and a women's college. Pop. 13,000. 2. Cap. of Leflore co., Mississippi, U.S.A., about 90 m. N.E. of Vicksburg. It manufus. cotton, drugs, furniture, and has saw-mills, canneries, and wood-working plants. Pop. 14,700.

Greenwood of Holbourne, Sir Hamar Greenwood, first Viscount (1870-1918), Brit. statesman, b. at Whitby, near Toronto, Canada. Educated at public schools at Whitby and at Toronto Univ. Settled in England in 1895. Called to the Bar by Gray's Inn, of which he became a bencher (1917). K.C., 1930. In Canada he had been an enthusiastic follower of Laurier and the Liberal party and, in 1900, he was offered the chance of standing for Grimsby in the Liberal interest but declined. In 1906, however, he entered Parliament as member for York city; defeated, 1910. Later member for Sunderland (till 1922). Acted for a time as parl. secretary to Mr. Churchill at the Board of Trade. In 1919, after active service in the war, he was appointed under-secretary at the Home Office and later moved to the Dept. of Overseas Trade. A year later he was appointed to the difficult post of Irish secretary. Here his task was to restore order in which he had some measure of success and to find some responsible persons who might be prepared to accept such form of treaty as, in fact, ultimately received legislative sanction. Within two years his task was finished and there was no further need for the office of chief secretary. He was thus the last in the long line of Irish secretaries who had sought with some

partial successes and many failures to achieve the impossible in Dublin Castle, and he had the satisfaction of bringing about the acceptance and final passing of the treaty that at length set up a form of home rule in Ireland and estab. the Irish Free State. G. was essentially an imperialist, and in later years came to find that his sympathies lay with the Conservative party, and he sat for Walthamstow in the Conservative interest until 1929, when he was raised to the peerage.

Greet, Sir Ben (1857-1936), Eng. actor-manager, b. in London, son of Capt. Wm. G., R.N. Educated at Royal Naval School, but became a schoolmaster and then an actor, joining a stock company at Southampton. First appearance in London was as Caius Lucius in *Cymbeline* at the Gaely, 1883. Went into management in 1880 and revived the practice of giving Shakespeare's plays outdoors, and had sev. companies of 'Woodland Players'. In 1895 he produced a number of plays for the Shakespeare Festival at Stratford-on-Avon. From 1890 to 1902 he toured in America with his own company, which included H. B. Irving, Mrs. Patrick Campbell, Robert Loraine, Dorothy Baird, Sybil Thorndike, and Leon Quartermaine. He co-operated with W. Poel, the founder of the Elizabethan Stage Society, and together they produced the old morality play *Everyman*. He was engaged at the Old Vic from 1911 to 1918 during which time he produced many of Shakespeare's plays, including *Hamlet* in full. From 1924 to 1926 collaborated with W. E. Stirling in producing plays in France and in establishing in Paris an Eng. theatre for the production of classics, 1925-27. Joined Sydney Carroll's open-air theatre in 1933-35.

Greestland, tn. and par. of W. Riding of Yorkshire, England, situated some 2 m. S.W. of Halifax. Pop. 4000.

Grégoire, Henri (1750-1831), Fr. statesman and ecclesiastic, b. near Lunéville and educated for the church. He was by nature a democrat and quickly identified himself with the Tiers Etat, taking a prominent part in the chief movement of the revolution. He became the constitutional bishop of Lorr-et-Cher. As such he aspired to remain true to Christianity and the Church until the Concordat with Rome was made. This event caused him to leave the Church, outside which he remained until his death. He pub. *L'Église gallicane* and, early in his career, *Essai sur la régénération de l'église*. See his *Mémoires* (with a biographical note by H. Carnot, 1831), and studies by P. Bohringer, 1871, and A. Pouget, 1905.

Gregor, William (1762-1817), Eng. scientist and clergyman, b. in Cornwall and educated at Bristol and Cambridge Univs., where he became a fellow of St. John's and entered holy orders. He was always an enthusiast amateur scientist, and though he preferred to settle in a remote vil. of Cornwall, he soon acquired a worldwide reputation as a metallurgical chemist through his analysis of such complex substances as topaz, uranium,

mica, and wavellite. But it is for his discovery of titanium that his name is chiefly remembered. It was in a Cornish valley that he found a black sand, now known as 'ilmenite,' which had peculiar magnetic properties. Treating this with sulphuric acid G. obtained a yellow solution which, when heated with powdered charcoal, yielded a slag which contained titanium. G., however, did not isolate the pure metal, succumbing to tuberculosis before he could carry his investigations further.

Gregorian Calendar, see CALENDAR.
Gregorian Chant, see PLAIN-SONG.

Gregorio, Paparschi, see INNOCENT II.

Gregorio, Rosario (1753–1809), It. archaeologist, b. at Palermo. He was educated for the church, took holy orders, and became prof. of theology at Palermo. He was commissioned by the king to superintend the opening of the tombs in his native city. He afterwards studied Arabic, and pub. in this tongue a hist. dealing with Sicily under the Arabs (this work was also issued in Lat.). In 1789 he was made prof. of public rights in Palermo Univ. His greatest work is *Considerazioni sulla storia della Sicilia dai tempi dei Normanni sino al presente* (1806–16), but he also pub. many old chronicles.

Gregorovius, Ferdinand (1821–91), Ger. historian, b. at Niedenbourg and educated at Königsberg. After spending some time as a teacher he finally took up his residence in Italy where he soon made the hist. of that country his special study. The result of his long-continued residence in Rome was the pub. of his great work, *Geschichte der Stadt Rom im Mittelalter* (1859–73), which has been trans. into Eng. and It. and deals with the hist. of Rome from about the year 400 to the death of Pope Clement VII, in 1531. It is written in marvelous detail and traces the hist. of the empire and the papacy during that time, showing that the connection between the two was greater than was usually imagined. His other works include *Geschichte der Kaisers Hadrian und seiner Zeit* (1851); *Lurezia Borgia* (1876); *Die Grabdenkmäler der Päpste* (1881); and *Geschichte der Stadt Athen im Mittelalter* (1894). See J. Honig, *Gregorovius als Dichter*, 1914, and *Gregorovius als Geschichtsschreiber*, 1921.

Gregory, St., called 'The Illuminator' (c. 240–c. 322), was of the royal race of the Arsacidae. His father, Anak, murdered the king of Armenia, for which crime the whole family was destroyed except G., who was rescued at the age of two years by his nurse. She brought him up as a Christian at Neocæsarea in Cappadocia. About 286, while doing mission work in Armenia, he was thrown into a pit where he was kept for fourteen years, but on healing King Terdat of an affliction he was released and became head of the Armenian Church, which flourished under his care. He d. in a cave about 322. See S. Malan's trans. of Vertabed Matthew's life, 1868.

Gregory, St., of Nazianzus (c. 329–389), doctor of the E. Church, b. at

Arianzus, near Nazianzus, in Cappadocia. A contemporary of Emperor Julian the Apostate of Athens. Appointed by St. Basil, bishop of Sasima, as a protest against the encroachment of the Emperor Valens in church matters. G. did not reside in his see long, but took up in 379 the task of reconciling to the Niceno faith the city of Constantinople, then Arian. His opponents succeeded at the Council of Constantinople in driving him from the see of that place, because he belonged to another diocese. His work had been accomplished, and he retired to Nazianzus, where he d. He left many poems, orations, and epistles. His works have been pub. by Hervagius (1550) and by the Benedictines (1778–1840). See monographs, Ullmann (Eng. trans., 1857) and Bénoit (1877).

Gregory, St., of Nyssa (c. 331–after 394), younger brother of Basil, bishop of Cesarea. He was a speculative theologian and wrote *Twelve Books against Eunomius*, *Ten Syllogisms*, *Heraclimeron*, etc. See complete eds. of his works in J. P. Migne's *Patrologia Graeca* (xlv.–xxvii.) (new ed., 1855–61). See also studies by J. Rupp, 1834, S. Heyns, 1835, J. Stigler, 1857, and E. Fleury, 1930.

Gregory, St., of Tours (538–94), Frankish historian, b. at Averni (now Clermont-Ferrand) in Auvergne. He is chiefly remembered as the author of *Historia sive Annalium Francorum libri X*, which covers a period from the creation of the world to the end of the sixth century, and is of great value to the student of early European hist. See the ed. by Arndt and Krusch (1885). His complete works may be found in J. P. Migne, *Patrologia Latina*, lxxi. See G. Kurth, *Gregoire de Tours*, 1878, and M. Pattison, *Essays*, i., 1889.

Gregory Thaumaturgus, St. (c. A.D. 210–70), apostle of Christianity in Pontus, b. at Neocæsarea, in Pontus, where he became a disciple of Origen. He was consecrated bishop of his native town in 240. His treatises, including a *Confession of Faith*, and a *Panegyricus* on Origen, may be found in A. Galland, *Bibliotheca graecolatina veterum Potrum*, iii., and in an ed. by J. A. Bengel, 1722. See V. Ryssel, *Gregorius Thaumaturgus*, 1880.

Gregory, name of sixteen popes:

Gregory I. (c. 590–604), surnamed the Great, was b. in Rome about A.D. 540. He entered a monastery (c. 575), and became one of the seven regnal deacons of Rome. Pelagius II. appointed him 'apocrisiarius' at Constantinople (c. 579–c. 586), and on his return to Rome abbot of St. Andrew's Monastery. On the death of Pelagius he was unanimously elected pope and consecrated Sept. 3, 590. He showed remarkable ability and wisdom in his administration of the church. He sent Augustine to christianize Britain, reconciled Spain to the faith, and abolished simony among the clergy of Gaul. He regulated the services and ritual, and reformed and standardised the chant. His works, comprising many homilies and letters, are important sources for church and profane hist. of the time, and are printed in J. P. Migne's

Patrologia Latina (vols. lxxv.-lxxxix.) and in folio (4 vols., 1705); they include *Moralia*, *Regulae pastorales liber*, and *Dialogorum liber*. See E. Fleury, *Hellenisme et christianisme: St. Grégoire et son temps*, 1931; and studies by E. Kellet, 1889; J. Barmby, 1892; F. A. Gasquet, 1904; H. Grisar, 1904, 1928; F. H. Dudden, 1905; and Brechter, 1941.

Gregory II. (715-31) was b. at Rome in 669. He sent Boniface as a missionary to Germany and did all in his power to promote Christianity among the heathen. By his conflict with Emperor Leo the Isaurian concerning sacred images as well as on the question of heavy taxation, he greatly increased the political power of the popes.

Gregory III. (731-41) was b. in Syria. He excommunicated the iconoclasts; he was unsuccessful in his attempt to obtain the help of Charles Martel against the Lombards.

Gregory IV. (827-44) recognised the supremacy of the Frankish emperor, and sided with Lothair in his quarrel with Louis the Pious. He instituted, it is said, the feast of All Saints.

Gregory V. (996-98). During his pontificate John XVII was set up as an anti-pope (996-98).

Gregory VI. (1045-46) bought the pontificate from his godson Benedict IX., and was deposed on a charge of simony in the following year. Hildebrand (afterwards G. VII.) accompanied him to Germany, where he d. in 1047.

Gregory VII. (1073-85), formerly Hildebrand, was b. at Soana, in Tuscany, about 1021, and was educated in the monastery of St. Maria, on the Arno, and afterwards at Cluny. He accompanied Leo IX. to Rome (1019), and entered holy orders. He succeeded Alexander II. as pope, and laboured to remedy the evils that existed within the church. He aroused the imperial displeasure for prohibiting the abuse of investiture, and was formally deposed by Henry IV. in 1076, whereupon G. inflicted a sentence of excommunication and ultimately made him submit to a humiliating penance at Canossa in 1077. In 1080 Henry again deposed G., proclaimed in his place the anti-pope Clement III., and laid siege to Rome (1081-84). G. was relieved by Robert Guiscard, and withdrew to Salerno, where he d. See studies by J. W. Bowden, 1846; W. Stephens, 1886; P. E. Villeneuve (Eng. trans., 1873); A. Vincent, 1896; A. Muthow, 1910; and A. J. Macdonald, 1932.

Gregory VIII. (Alberto de Mora, Oct. 21 to Dec. 17, 1187) was b. at Benevento. He made peace with Henry VI. and reconciled the Pisans and the Genoese. He d. at Pisa while inaugurating a new crusade to recover Jerusalem.

Gregory IX. (Ugolino dei Segni, 1227-1241) was b. of noble family at Anagni, and studied at Paris and Bologna. He excommunicated Frederick II. for refusing to take part in the crusades, absolved him in 1230, but again excommunicated him in 1239. The emperor marched on Rome (1241), but G. d. before the siege began. He made rules against the here-

tics and systematised the Inquisition. See his letters in *Monumenta Germaniae historica*, 1883, and studies by P. Balan, 1872-73; J. Felton, 1886; and L. Zarncke, 1930.

Gregory X. (Tebaldo Visconti, 1271-76) was b. at Piacenza in 1208. During his pontificate a temporary union was brought about between the Gk. and Rom. Churches, and the constitution of the conclave was determined upon (1274).

Gregory XI. (Pierre Roger, 1370-78) was b. at Limousin in 1330. He reformed the monastic orders, tried to make peace between England and France, and at the earnest entreaty of St. Catherine of Siena transferred the papal see from Avignon back to Italy (1377).

Gregory XII. (Angelo Cornaro, 1406-15) was b. of noble family at Venice about 1327. He opened negotiations with the anti-pope, Benedict XIII. (1408), but on his creation of new cardinals, his former cardinals left him, and both popes were deposed (1409) in favour of Alexander V. G. retaliated by banning Benedict and Alexander as schismatics, but was banished from Naples in 1411 and sent in his resignation to the Council of Constance (1415). He became cardinal-bishop of Porto, and d. at Recanati in 1417.

Gregory XIII. (Ugo Buoncompagno, 1572-85) was b. at Bologna in 1502. He took part in the Council of Trent (1562-1563). He denounced heresy, helped the Irish against Elizabeth, subsidised Philip II. in his wars against the Netherlands, and supported the Catholic League in France. He promoted the work of the Jesuits, and estab. the Collegium Germanicum in Rome. On Feb. 24, 1582, he brought about the reform of the calendar.

Gregory XIV. (Nicolò Sfondrato, 1590-1591) was b. at Cremona in 1535. He was under the influence of Philip II., and excommunicated Henry of Navarre.

Gregory XV. (Alessandro Ludovisi, 1621-23) was b. at Bologna. He founded the Congregation of the Propaganda, and helped Ferdinand II. in the Thirty Years war.

Gregory XVI. (Bartolomeo Cappellari, 1831-46) was b. at Belluno in 1765. He entered the order of the Camaldolesians, and later was sent to Rome and created cardinal. He was a great patron of learning and spent money lavishly on architecture. He wrote *Il Trionfo della Santa Bude* (1799). See life by Sylvain, 1889; also N. Wiseman, *Recollections of the Last Four Popes*, 1858, and F. Nicesen, *History of the Papacy in the Nineteenth Century*, 1906.

See also L. Ranke, *History of the Popes*, 1879; L. Pastor, *History of the Popes* (Eng. trans., 1899); M. Creighton, *History of the Papacy*, 1899; and H. K. Mann, *Lives of the Popes*, 1902-10.

Gregory, name of a Scottish family, distinguished in mathematics and medicine:

James Gregory (1638-73), native of Aberdeen, and educated at the grammar school and Marischal College of that city. He invented the Gregorian reflecting telescope, described in his *Optica Promotu*

(1663). While studying at Padua Univ. he pub. *Vera circuli et hyperbole quadratura* (1667); *Geometria Pars Universalis* (1668); and *Exercitationes Geometricae* (1668). He was elected F.R.S. and prof. of mathematics at St. Andrews (1689) and Edinburgh (1674).

David Gregory (1661–1708), nephew of above, b. in Aberdeen. He was appointed prof. of mathematics at Edinburgh (1683–1691), and Savilian prof. of astronomy at Oxford (1691–1708). He was a friend and admirer of Newton. Chief pubs: *Exercitatio Geometrica de Dimensione Figurarum* (1684); *Astronomie Physica et Geometrica Elementa* (1702); and an ed. of Euclid (1703).

John Gregory (1742–73), grandson of James G., b. at Aberdeen. He studied medicine at Edinburgh and Leyden, becoming prof. of medicine at Aberdeen (1755) and at Edinburgh (1766–73). His works include *A Comparative View of the State and Faculties of Man* (1765) and *Elements of the Practice of Physic* (1772); his collected works were ed. by Tytler (1788).

James Gregory (1753–1821), son of John G. and a native of Aberdeen. After studying at Edinburgh, Oxford, and abroad, he became prof. of medicine at Edinburgh (1776). He wrote *Conспектus medicinae theoretice* (1788) and *Literary and Philosophical Essays* (2 vols.), 1792.

William Gregory (1803–58), son of the preceding. He became prof. of chem. at Glasgow (1837), Aberdeen (1839), and Edinburgh (1844). He was among the first to advocate Liebig's theories in Great Britain, and trans. Liebig's *Principles of Agricultural Chemistry*, 1853. He also wrote *Outlines of Chemistry* (1845) and *Elementary Treatise on Chemistry* (1853). Consult A. G. Stewart, *The Academic Gregorius* (Famous Scots series), 1896.

Gregory, Isabella Augusta, Lady (1852–1932), Irish playwright and theatrical patentee; youngest daughter of Dudley Perse, of Roxborough, co. Galway. Married, 1880 as his second wife, Sir Wm. Henry G., a former M.P. for Dublin city and co. Galway. In the last years of the nineteenth century she was foremost in founding a national drama in Ireland, and in 1904 she obtained a patent for the Abbey Theatre—the present home of that drama. Wrote many one-act plays, including *The Workhouse Ward*, *The Gaol Gate*, *The White Cockade*, and *Dave*. Rendered Irish sagas into the Irish dialect of Eng. and also made adaptations from Moliere. She did much to preserve Irish folk-lore. With Yeats and Synge she was one of the leading figures of the older generation of dramatists in the modern Irish theatre. In 1916 she began to incorporate her records, diaries, and personal memoranda into a series of private journals, which eventually reached a total of forty-two typewritten vols., pub. as *Lady Gregory's Journals, 1916–1930* (1946) and ed. by Lennox Robinson. It is an informed commentary by one who possessed an original creative genius of her own and a flair for detecting and encouraging genius in others.

Gregory, Sir Richard Arman (b. 1861), Eng. astronomer and scientist, b. at Bristol. He was educated at an elementary school and at evening classes, and later studied at the Royal College of Science. Here he met H. G. Wells, with whom he was associated until Wells's death in 1946. He was editor of *Nature* from 1919 to 1939. Knighted in 1919 and created a baronet in 1931. He has been president of many scientific and educational societies, and is a fellow of the Institute of Physics and of the Royal Astronomical Society. The culmination of his career was his election as president of the Brit. Association for the Advancement of Science (1940–46). In 1893 he was joint author, with H. G. Wells, of *Honours Physiography*. His book *Religion in Science and Civilisation* (1940) is a masterly analysis of the whole process of civilisation. On the same theme is his *Gods and Men* (1949). Other pubs.: *British Scientists* (1941); *Science in Chains* (1941); and *Education in World Ethics and Science* (1941).

Gregory, Lake, large salt lake in S. Australia, E. of Lake Erie.

Groß, Martin (1839–1911), pseudonym of Friedrich Hermann Frey, a Ger. dramatist. He was b. at Speier and educated at Munich. His lyrics, which are beautiful and full of noble sentiment, are collected in *Gedichte*, 1868, and *Neue Lieder und Marchen*, 1902. His dramatic pieces include *Nero* (1877); *Martino Falieri* (1879); *Konradin* (1888); *Agnes Bernauer* (1894); *General York* (1899), and *Schiller's Demetrius* (1901). *Hans Sachs* (1866, re-cast 1894) appeared under his own name.

Greifenberg, see GRYFICE.

Greifenhagen, see GRYFINO.

Greifswald, tn. in Pomerania, Germany, about 3 m. from the Baltic and 70 m. N.W. of Stettin. It is situated on the r. b. of the navigable Ryck, 24 m. above its mouth. It was founded by some Swedish traders about 1241. There is a fine old church and some late Gothic gabled houses. The univ. was founded in 1156 and owns some famous tapestry. There are iron foundries and railway carriage works. During the greater part of its hist. it was a Swedish tn., and only became Ger. in 1815. Pop. (1930) 40,000.

Greisen, substance resembling pale granite, from which it differs by the absence of felspar and biotite. It consists essentially of quartz and muscovite, the latter, which has a pearly lustre, giving it a silvery appearance. Accessory minerals are topaz, fluorspar, apatite, etc. Containing small amounts of tin oxide, it is worked as a source of this metal in Cornwall, Saxony, and Tasmania.

Greiz, tn. in Thuringia, Germany, situated about 50 m. from Leipzig, and is in the middle of the White Elster valley. Its manufs. are cashmeres, merinos, and other fabrics, and there are large dye-works. Pop. 39,900.

Grenada, is. of the W. Indies which belongs to Great Britain, situated at the southernmost point of the Caribbees. It is 21 m. in length and about 12 m. in breadth, and has an area of 13·3 sq. m.

The is. is volcanic, having many craters, the highest of which is St. Catherine, which is about 2750 ft. The climate of G. is equable and healthy, but the rainfall is usually excessive, being often more than 200 in. per annum. The is. is practically free from hurricanes. The maximum mean temp. is 90° F., and the minimum 68°, but in the mts. it falls below 60°. The cap. of the is. is St. George's (pop. 6000) situated on a very fine harbour. It was estab. by the Fr. in 1705, when it was called Fort Royal; it received its present name during the administration of Governor Robert Melville (1764-71) when an ordinance was passed substituting Eng. for Fr. names. In St. George's Church, which was built soon after 1763, are tablets erected in 1799 to the memory of the victims of the Briggans' war (see below). Gov. House stands on rising ground overlooking the tn. and harbour. It was built in 1802-7 and modernised in 1887 and 1902. A favourite excursion from St. George's is the drive to the Grand Etang (Large Pond), a freshwater lake 2½ m. in circumference and 1740 ft. above sea level and occupying the crater of an extinct volcano. Other tn. are Grenville or La Baye on the E. of the r., Charlotte Town or Gouyave (2500), and Hillsborough (100). Columbus discovered G. in 1498 on his third voyage, when he was hastening back to his colony on Espanola after finding and naming Trinidad. Some say that he named the is. Ascension, others that he named it Conception; no one knows when it received its present name. The Spaniards left it alone, partly because there was no gold there and partly on account of the Caribs. In 1651 du Parquet, Fr. governor of Martinico (Martinique), attracted by the fertility of the is., tried to induce the Caribs to part with the is. by presents of knives, hatchets, and brandy, but in vain. He thereupon erected a fort, fighting broke out, and the Caribs were soon reduced to less than a hundred, the last fugitives being driven to a rock overhanging the sea whence they leapt to their death. This spot, Le Morne des Sauteurs, is on the N. coast and retains its name to-day. A few years later du Parquet sold the is. to the Comte de Cerfillac for about £2000, who installed as his governor a man whose oppression resulted in his being tried and shot on the top of the hill on the Grand Etang road. Cerfillac in his turn sold the is., and for the next ten years, 1664-74, it was owned by the Fr. W. Indian Company, and then devolved on the Crown. The Eng. seized it in 1762, at the time of Rodney's first cruise in the W. Indies, but the Fr. recaptured it in 1779. Three years later Rodney's great victory over de Grasse (see SAINTS, BATTLE OF THE) recovered the is., and it has been in Brit. hands ever since. One of the prin. events in the hist. of G. is the Briggans' war in 1795. This was really a rebellion, instigated by the revolutionary fanatic, Victor Hugues of Martinique, and was the last Fr. attempt to recover the is. The rebels, led by Julien Fédon and inflamed by Fr. revolu-

tary doctrine, committed great excesses, among which was the massacre of Lt.-Governor Home and some forty-eight Brit. subjects. The rising was suppressed in 1796, the Royal Black Rangers showing great gallantry against odds in the investment of the rebel camp on Port Royal Hill. In 1766, when the four is., G., Dominica, St. Vincent, and Tobago, were formed into the gov. of G., a general council was set up for them by the first governor. Later the other is. became separate colonies from G., while Tobago was ceded to France. There was another period in which the is., though retaining its own legislature, came under the authority of the governor-in-chief of Barbados. But in 1885 G., St. Vincent, St. Lucia, and Tobago were grouped together as the Windward Is., and the situation to-day is that there is one governor in common for the is. constituting the Windwards (now G. and the Grenadines, St. Lucia, St. Vincent, and Dominica), who resides in G. and is represented in the other is. by administrators. G. was under the old colonial representative form of gov. from 1766 to 1875. The massive and highly prized 45-lb. silver mace appeared on the table of the House of Assembly for over a century, but in 1876, when G. was proclaimed a crown colony, the mace was taken away and only reappeared in 1931 when the new legislative council with elected members was opened. The chief crop is cocoa; sugar and rum were formerly the chief industries, but now not enough sugar even for local needs is produced. The chief exports are cocoa, nutmegs, mace, raw cotton, and lime oil. There are elementary and secondary schools. Carricou, the largest of the Grenadines, is attached to G. for administrative purposes. Pop. (estimated 1947) 72,600. See D. G. Garraway, *The Insurrection, 1795-6, 1877*, and *The Grenada Handbook and Directory* (ann.).

Grenade, ball of iron which is made hollow and filled with explosive material. By means of a lighted fuse the ball is exploded. Hand-Gs. were at one time carried by soldiers and thrown amongst the enemy, hence the term grenadiers. Gs. played an important part in the Jap. attacks on the trenches at Fort Arthur in 1901. Both Germany and Great Britain had adopted Gs. just before the outbreak of the First World War; the former had a rifle G. and the latter a 'stick' G., both exploding on impact. Germany, however, was well supplied, whereas Great Britain, in common with her Allies, was forced to improvise Gs. from condensed milk tins and similar receptacles. Many varieties were invented during the First World War, the best known on the Allies' side being the Mills (see also BOMB). This was fitted with a time fuse connected with a lever held in position by the hand and made to open only when the G. had been thrown. This pattern was modified for use as a rifle G. Nearly every pattern had a cast-iron segmented body which split up when the G. exploded.

Grenadier, originally a soldier trained

to throw hand-grenades, who had to be distinguished by his height and strength. Subsequently the word was applied to a member of the first company of a battalion. It is now used only of the G. Guards, formerly the first regiment of foot guards.

Grenadier Guards ranks as the first regiment in the Brit. Army, though of later date than the Coldstream Guards (q.v.). The G. G. date from 1685, in which year a royal regiment of guards, raised by Col. Russell at the Restoration as a bodyguard for Charles II., were combined with Lord Wentworth's regiment formed in 1656, the combined unit being styled the First or Grenadier Regiment of Foot Guards. The G. G. fought at Namur in 1695; at the siege of Gibraltar, 1704-5; in all Marlborough's great battles; at Dettingen, Egmont-on-Zee; with Moore at Corunna and with Wellington in the Peninsula and at Waterloo. In the Crimean war they were at Alma, Inkermann, and Sevastopol; in Egypt at Tel-el-Kebir and Suakin and at Khartoum; and in the S. African war with Methuen at Modder R. On the outbreak of the First World War the 2nd Battalion of the G. G. joined Gen. Sir John French's 'Contemptible Little Army' and took part in the famous retreat from Mons and the battles of the Aisne and the Marne. At the end of Oct. 1914 it defeated the renowned Prussian Guard in their many efforts to break the Brit. line and reach the channel ports. The 1st Battalion landed at Zeebrugge on Oct. 7, 1914, and took up a position in the Ypres sector. In March 1915 it distinguished itself at the battle of Neuve Chapelle. The 3rd Battalion went overseas in August 1915, and the 4th Battalion joined it later in the year. In the summer of 1915 the battalions of Foot Guards at the front were formed into a Guards Div. under the command of Lord Cavan. In the 1916 battle of the Somme the 1st Battalion made a great name for itself by its gallant conduct at the action at Les Boeufs. The prin. operation in which the G. G. took part in 1917 was the breaking up of the Ger. offensives in July and Aug. on the Yser Canal. The successes gained here drew a message of admiration and praise from the king. In Nov. they moved further S. and took part in the attack against Cambrai (q.v.) in which the 4th Battalion earned the special thanks of the G.O.C. 40th Div. for advancing to his support at Bourlon Wood (q.v.) across the open, which was under heavy shell fire. From Jan. to March 1918 the G. G. were in the Arras sector (see ARRAS, BATTLE OF) and felt the full force of the great Ger. breakthrough. By the time the Allies' counter offensive was launched in Aug. all battalions had been reorganised and re-equipped. In this offensive the 1st Battalion gained further laurels by the capture of St Leger and at the crossing of the Canal du Nord. In the latter operation Viscount Gort was twice wounded, his gallant conduct winning for him the V.C. After the armistice the Guards Div. formed part of the Army of Occupation in Germany. In the

Second World War the G. G. fought on the W. front and as part of the Eighth Army (q.v.) in N. Africa and Italy. They were equally conspicuous in the battle of Flanders and at Dunkirk (1940), where their former leader, Viscount Gort, was now commander-in-chief (see GORT, VISCOUNT). On the lt. front the G. G. were in action all through the bitter fighting of the autumn of 1943 up to the battles on Monte Cassino, and in 1944 they were at the Anzio beachhead. As part of the Brit. Guards Armoured Div. the G. G. were in the heavy fighting in the Nijmegen area in 1944 and in many of the battles of the 21st Army Group both W. and E. of the Rhine in 1945. See P. Forbes and N. Nicolson, *The Grenadier Guards in the War 1939-45*, 1949.

Grenadines, chain of small is. belonging to the W. Indies, in the Windward group. They extend between St. Vincent and Grenada for 60 m., and are of volcanic origin. Carriacou, Union, and Canauan are the largest, and they yield coffee, cotton, sugar, and indigo. Pop. 6770. See also GRENADA; ST. VINCENT.

Grenelle, suburb of Paris, France, on the Seine, famous for its artesian well, which supplies water to the upper part of the city. The well has a depth of 1704 ft. and a temp. at the bottom of 82°-85° F.

Grenfell, Bernard Payne (1869-1926), Eng. Egyptologist, b. at Birmingham, son of John Glanville G.; educated at Clifton College and at Queen's College, Oxford. In 1894 he began excavations in Egypt, and, in collaboration with A. S. Hunt, pub. his important discoveries of anc. papyri, including *Sayings of our Lord* and *New Sayings of Jesus*. A fellow of the Brit. Academy, and from 1908 prof. of papyrology at Oxford Univ. His pubs. include *The Revenue Laws of Ptolemy Philadelphus* (1896); *An Alexandrian Erotic Fragment* (1896); and, in conjunction with A. S. Hunt, *The Geneva Fragment of Menander* (1898); *The Amherst Papyri* (1900-1); *The Tebtunis Papyri* (1902); and *The Hibeh Papyri* (1906).

Grenfell, Francis Wallace, Baron (1841-1925), Brit. general, b. in London. He was educated at Blandford, and entered the army in 1869, attaining the rank of captain in 1871. He served in the Kaffir war, 1878, and in the Zulu war, 1879. During the war in the Transvaal, 1881-82, he served as assistant quartermaster-general under Sir Evelyn Wood. He distinguished himself in the Egyptian war, fighting at Tel-el-Kebir in 1882. He took part in the Nile Expedition, 1881; and was sardar of the Egyptian Army, 1885-92. He commanded the operations at Suakin, 1888, and won the battle of Toski, 1889. From 1894 to 1897 he was at the War Office as inspector-general of auxiliary forces. In the latter year he again took command in Egypt, and he was commander-in-chief and governor-general of Malta, 1899-1903. He commanded the 4th Army Corps, 1903-4, and the forces in Ireland, 1904-5. He was created 1st Baron G. of Kilvey in 1902, and made field marshal in 1908.

Grenfell, George (1849-1906), Eng. explorer and missionary, b. at Lancer in Cornwall. In 1874 he went to Kamerun under the Baptist Missionary Society, and with Comber explored the country. Four years later he went to the Congo to make an extensive survey, and in 1885 explored the Ubangi R. During 1891-92 he served on a commission as a delegate of the Congo Free State to determine the boundary line between that country and the Portuguese ter. See Sir H. Johnston, *George Grenfell and the Congo*, 1908, and G. Hawker, *Life of George Grenfell*, 1909.

Grenfell, Julian Henry Francis (1888-1915), Eng. soldier and poet, b. in London, eldest son of first Baron Desborough. He was educated at Summer Fields, Eton, and Balliol College, Oxford. He passed, 1910, into the army, first of all univ. candidates, and went to India to join the 1st Dragoons with which corps he went to S. Africa, 1911. He served in Flanders in First World War. Twice mentioned in despatches, and received the D.S.O. D. from wounded, May 26. He was over 6 ft. tall, full of enthusiasm and vague ideals, which embraced religion and a love of war. In the year of his death he had written the sounding poem *Into Battle*. See T. Sturge Moore, *Saint Soldier Poets*, 1919.

Grenfell, Sir Wilfred Thomason (1865-1919) ('Grenfell of Labrador'), Brit. medical missionary, whose name is inseparably associated with the development and well-being of Labrador, a desolate and barren country where disease was rife and living precarious. B. at Parkgate, Cheshire; educated at Marlborough and Oxford; studied medicine at the London Hospital, being house surgeon to Sir Frederick Treves. First visit to Labrador began with a cruise as medical missionary with the Royal National Mission for Deep Sea Fishermen, and in 1892 he went to Labrador as permanent medical missionary. His valuable pioneering work there greatly improved the lot of the local fishermen. His schemes for the development of Labrador grew far beyond the means of the mission, so he organised lecturing tours in Britain, Canada, and the U.S.A., until eventually, largely with Amer. support, the International Association was founded with an endowment of over £200,000. He built hospitals, nursing stations, orphanages, schools, and stores in Labrador. He owned and operated steamships and yachts in connection with his various hospitals, and was himself surgeon-in-chief and master of a hospital steamship which cruised the coasts of Labrador. In 1912 he opened the King George V. Seamen's Institute, the foundation stone of which was laid by the king by electric message from England. In the First World War he was with the Harvard surgical unit in France. Essentially of the pioneering temperament, the effectiveness of his work was enhanced by an attractive and strongly individual personality. Eloquently voiced the charms of Labrador both by word and pen. Among his numerous works are *Vikings of*

To-day (1895); *The Harvest of the Sea* (1905); *Labrador: the Country and its People* (1909, new ed., 1922); *Autobiography of a Labrador Doctor* (1919); *Labrador Looks at the Orient* (1928); and *The Romance of Labrador* (1934). In 1920 he was awarded the gold medal of the National Academy of Social Sciences of America, and in 1930 the Livingstone gold medal of the Royal Scottish Geographical Society. See J. B. Mathews, *Wilfred Grenfell: Master Mariner*, 1924, and F. L. Waino, *Grenfell: Knight-errant of the North*, 1921.

Grenfell, William Henry, first Baron Desborough of Taplow (1855-1945), son of C. W. G., M.P. Was educated at Harrow and Oxford. A great all-round athlete at school and at the univ.; he also twice swam Niagara. He represented Salisbury in Parliament in 1880, 1885. He was returned M.P. for Horncastle in 1892, but resigned, and later represented the Wycombe div. of Buckinghamshire in the Conservative interest. G. was a member of the Tariff Commission of 1901, and was president of the Central Association of Volunteer Regiments. Chairman of committees on policy, and on freshwater fish, and of the Thames Conservancy Board, father of Julian G., the poet.

Grenoble (ancet. *Gratianopolis*), former cap. of the Dauphiné, now a first-class fortress and chief city of the dept. of Isère in S. France, 60 m. S.E. of Lyons. Its bishopric was founded in the fourth century; there are many interesting buildings, including the fifteenth-century cathedral of Notre Dame and the Gothic Palais de Justice. The tn. has a univ. of three faculties, with a magnificent library. The chief manuf. are kid gloves, liqueurs, paper, cement, hats, and artificial flowers, and considerable trade is done in walnuts, grain, and cheese. Silk-spinning and iron-founding are also carried on (see A. Prudhomme, *Histoire de Grenoble*, 1888). An Amer. flying column reached G. on July 23, 1944, only eight days after Brit., Amer., and Fr. forces landed in S. France. Pop. 102,100. See further under WESTERN FRONT IN SECOND WORLD WAR.

Grenville, George (1712-70), Eng. statesman, educated at Eton and Christ Church, Oxford. He sat in Parliament as member for Buckingham from 1741 till his death. After having held various offices he became secretary of state, 1762; first lord of the admiralty, 1762-63; chancellor of the exchequer, first lord of the treasury, and Prince Minister, 1763-1765. His ministry is especially remembered for the prosecution of Wilkes and the passing of the Amer. Stamp Act, 1765. See *The Grenville Papers*, 1852-53.

Grenvilles, Richard, see TEMPLE, EARL.

Grenville, or Greynville, Sir Richard (c. 1511-91), famous Eng. seaman, of an ancient Cornish family. He commanded Raleigh's expedition to Virginia in 1585-1586, and was in command of the *Revenge* in the fight with the Sp. fleet off Flores in the Azores, and d. on board the enemy's flag-ship, *San Pablo*. See Sir Walter Raleigh, *The Truth of the Fight about the*

Iles of Azores, 1591; G. Markham, *The Most Honourable Tragedie of Sir Richard Grinuile, Knight*, 1595; J. Froude's essay in *Short Studies on Great Subjects*, 1867; Tennyson's ballad, *The Revenge*; and A. L. Rowse, *Sir Richard Grenville*, 1949.

Grenville, Richard Plantagenet Temple Nugent Brydges Chandos, see BUCKINGHAM AND CHANDOS, DUKE OF.

Grenville, William Wyndham, Baron (1759-1831), Eng. statesman, son of George G. He was educated at Eton and Christ Church, Oxford, and entered Parliament as member for Buckingham in 1782. He became secretary to his brother Earl Tennyse, then lord-lieutenant of Ireland, and paymaster-general of the army under his cousin, Wm. Pitt. He was appointed in succession Speaker of the House of Commons (1789); secretary of state for the home dept. (1789); and foreign secretary (1791). Pitt and his colleagues resigned office in 1801, on George III.'s refusal to pass the Catholic Emancipation Bill. G. formed part of the short-lived 'Gov.' of all the Talents, 1806-7. He ed. Chatham's letters to his nephew (1804) and wrote *Lugae Metrice* (1824). See E. D. Adams, *Influence of Grenville on Pitt's Foreign Policy*, 1904.



SIR THOMAS GRESHAM

Gresham, Sir Thomas (1519-79), Eng. merchant, founder of the Royal Exchange. He was apprenticed to his uncle, Sir John G., a London mercer, and in 1513 was admitted a member of the Mercers' Company. He held the post of 'king's merchant' in Antwerp from 1551 to 1557. For a short while he acted as Queen Elizabeth's ambas. at Brussels (1559). During 1566-71 he erected the Royal Exchange on the model of the one in Antwerp, and left a large sum of money to endow a college with seven lectureships. His house in Bishopsgate Street was converted to this purpose, and in it lectures were given from 1597 to 1768. See Dean Burgon, *Life and Times of Sir Thomas Gresham* (2 vols.), 1839, and C. Unwin, *Studies in Economic History*, 1927.

Gresham's Law was first so called by Macleod in 1857, on the understanding that the principle 'bad money drives out good' was first expounded by Sir Thomas Gresham to Elizabeth in 1558. Early economic writers, such as Copernicus, had, however, already explained it. The principle is that the worst form of currency will be most used in circulation and the more valuable tend to disappear. Thus, if there are two metals in circulation, the one which costs least in production will predominate. The law also applies where there is debased coinage in circulation with full-weight coinage, and metallic currency with convertible paper money.

Gresset, Jean Baptiste Louis (1709-77), Fr. poet and dramatist, b. at Amiens, where he was brought up by Jesuits, whose society he later joined. In 1734 he pub. his delightful poem, *Vert Verd*, of a convent parrot, but owing to the ridicule which the poem poured on monks and nuns G. was expelled from the society. His reputation was made, and he returned to Paris, where he pub. a second poem, *La Chartreuse*, followed by *Carméne impromptu* and *Lytrin riant*. He produced a tragedy, *Edouard III.* (1740), and two comedies, *Le Merchant* and *Sidney* (1745). He was admitted to the Academy, 1748. See A. A. Renouard's ed. of his poems, 1811, and the lives by St. Albin Berville, 1863, and by Jules Voge, 1894.

Greta Hall is situated in the Vale of Keswick, Cumberland, and consists of two houses under one roof. Coleridge took up his residence (1800-3) in one half, and in 1803 Southey occupied the other till his death in 1843.

Gretta Green, vil. in Dumfrieshire, Scotland, 9 m. N.N.W. of Carlisle. It was formerly notorious for the clandestine marriages which were, after the abolition of Fleet marriages (1754), held here, as being the nearest place within the Scottish border line. In 1856 a law was passed requiring one of the parties to reside in Scotland for three weeks previously. In the 'blacksmith's shop' case, at the court of session, Edinburgh (1939), in which Lord Russell rejected the claim of the partners of the blacksmith's shop and Gretta museum to the exclusive use of the name 'blacksmith's shop' as a description of the premises, the judge affirmed that the legend or belief as to irregular runaway marriages being performed in bygone days by a blacksmith as the so-called priest, or in a smithy, was unfounded in fact - a belief which, without doubt, has led to many of the G. G. marriages. A collision between two passenger trains and a troop 'special' occurred here on the Caledonian Railway on May 22, 1915, involving 227 deaths. See P. O. Hutchinson, *Chronicles of Gretta Green*, 1844. Pop. 2800.

Grétry, André Ernest Modeste (1741-1813), Fr. operatic composer; comedy was his forte, and his efforts in this direction won for him a very wide contemporary reputation, which has, however, diminished considerably, although he is regarded by musical historians as the originator

of the modern type of Fr. comic opera. His operas number about fifty, the best being *Le Tableau parlant* (1769); *L'Amant jaloux* (1778); *Le Caravane de Cairo* (1783); and, perhaps his finest achievement—certainly his most popular one—*Richard Coeur de Lion* (1784). See studies by J. E. Bruyr, 1931, and J. Sauvienor, 1934.

Greuze, Jean Baptiste (1725–1805), Fr. genre and portrait painter, b. at Tournus, near Mâcon, in Burgundy; studied in the Academy at Paris. His first picture, ‘Le l’ère de famille expliquant la Bible à ses enfants,’ was so good that his teachers doubted whether it was his sole production. His success, however, was followed up, and he won great popularity, especially for his pretty heads of young girls. He was elected to the Academy in 1769. His chief works are ‘Aveugle trompé’ (1755); ‘La Jeune Fille à l’agneau’; ‘La Jeune Fille qui pleure le mort de son oiseau,’ etc. See life by C. Maucclair, 1905, and E. Pilon, *Greuze, peintre de la femme*, 1912.

Greville, Charles Cavendish (1791–1865), Eng. diarist; educated at Eton and at Christ Church, Oxford. He became private secretary to Earl Bathurst and clerk of the council in ‘Almanac’ (1821–60), during which time he made excellent use of his opportunities for studying court and political life. He left his jour. to Henry Reeve, with the request that it should be pub. soon after his death. Accordingly instalments appeared in 1875, covering the years 1820–37; in 1885, covering 1837–51; and the third portion, 1852–60, in 1887. These memoirs are of great value to students of nineteenth-century hist.

Greville, Sir Fulke, Lord Brooke (1554–1628), Eng. poet, b. at Beauchamp Court, Warwickshire. He was educated at Cambridge and Oxford, and travelled abroad; entered the court of Queen Elizabeth in 1577. He was a friend of Sir Philip Sidney, whose life he wrote (posthumously pub. in 1652). G. wrote a tragedy, *Mustapha*, in 1609, some sonnets, and a considerable number of laboured didactic poems. He was chancellor of the exchequer from 1614 to 1621, and was killed in a quarrel with his serving-man. See A. Groenveldt, *The Friend of Sir Philip Sidney*, 1894, and his ed. of *Greville’s Collected Works*, 1870.

Gréville, Henry, see DURAND, ALICE.

Grévy, François Paul Jules (1807–91), president of the Fr. Republic, b. at Mont-sous-Vaudrey, Jura. Became an advocate in 1837. In 1848 he was elected by the republicans of his dept. to the Constituent Assembly, of which he became vice-president. He vigorously opposed the second empire under Louis Napoleon. In 1863 he was returned as deputy for the Jura and was elected president of the National Assembly in 1871. On the resignation of Marshal MacMahon in 1879 he was elected president of the republic. In 1885 he was re-elected for a further period of seven years, but, on the discovery of his son-in-law Daniel Wilson’s dishonest traffic in the decorations of the Legion of

Honour, he was obliged to resign office. See his *Discours politiques et judiciaires*, ed. by L. Delabrouse (2 vols.), 1888, his life by A. Barbou, 1879, and A. Dansette, *L’Affaire Wilson et la chute du Président Grévy*, 1936.

Grey, Albert Henry George, fourth Earl (1851–1917), Brit. administrator; b. Nov. 28, the son of Gen. Hon. Charles G. He was educated at Harrow and at Trinity College, Cambridge, and entered Parliament as Liberal member for S. Northumberland in 1885. He succeeded his uncle in the earldom, 1894. In 1896–1897 he was administrator of Rhodesia, where he was associated with Cecil Rhodes. He was director of the Brit. S. Africa Company 1898–1904, and lord-lieutenant of Northumberland, 1899–1901. He succeeded the earl of Minto as governor-general of Canada, 1904–11. His pub. *Hubert Hervey, a Memoir* (1899).

Grey, Charles, second Earl (1764–1815), Eng. statesman, b. at Fallodon, Northumberland, and educated at Eton and Cambridge. In 1786 he was returned by Northumberland to Parliament in the Whig interest; he vigorously opposed the policy of Wm. Pitt, associating himself with Fox, Burke, and Sheridan as one of the managers of the impeachment of Warren Hastings. On Burke’s supporting the gov. in declaring war upon France during the revolution, G. remained faithful to his leader. He was one of the founders of the Society of the Friends of the People, and asserted that Parliament did not represent the nation. He moved the impeachment of Pitt (1797), and took part in the secession of the Whigs as a protest against his policy. On the formation of the Fox–Grenville ministry, he was appointed first lord of the Admiralty (1806) and, on the death of Fox, foreign secretary and leader of his party. During his ministry Wilberforce’s Act abolishing African slavery was passed (1807). In that year his ministry retired and he led the opposition till 1830, when he became Premier and first lord of the treasury. During this term of office the great Reform Bill went through all its readings, and passed the House of Lords in 1832. In 1834 he resigned office on the Irish question, and retired from public life. See his *Correspondence with William IV*, 1867; *Correspondence with Princess Lieven*, 1890; and the life, written by his son, Charles Grey, 1861.

Grey, first Viscount, Edward of Fallodon, Lord Grey (1862–1933), Eng. statesman, the grandson of Sir George G., Gladstone’s colleague. He was educated at Winchester and at Balliol College, Oxford, and entered Parliament in 1885, representing Berwick-on-Tweed as a Liberal. During the Rosebery administration (1892–95) he was appointed under-secretary for foreign affairs. From 1905 until 1916 he was secretary for foreign affairs, and received for his distinguished services the K.G. in 1912. He was largely responsible for the successful conclusion of the negotiations following the Balkan war of 1912–13, at the termination of which the peace of London was signed in 1913. As

foreign secretary during the fateful months of July and Aug. 1914 he strove to avoid the disaster of the First World War. He believed in the efficacy of conferences in settling disputes, whether local or international, and had demonstrated their success. That he failed to persuade Germany in 1914 to similar recourse was due to the determined aggression of the Ger. war lords, which was calculated to override the pacific counsels of the ablest statesmen of any time. In 1915 he was raised to the peerage as Viscount G. of Fallodon, and retired from the Foreign Office on the fall of the Coalition ministry. During his long term of office he had shown an unwavering devotion to the highest conceptions of honourable conduct. Indeed he has been criticised for his aloofness from those suave veiled artifices which are claimed to be necessary to diplomacy.

In 1918 he went to the U.S.A. as ambassador until Jan. 1920, during which period he issued his pamphlet on the League of Nations. Ever since, in 1918, he had informed President Wilson through Col. House (q.v.) that the existence of a permanent European conference during 1914 would have made the First World War impossible, his ardour for settlement of problems by a league or union had increased, and he became an enthusiastic member as soon as the League of Nations was formed. From 1920 to 1924 he held the leadership of the Liberal party in the House of Lords. In 1925 he pub. his reminiscences under the title of *Twenty-five Years*. In 1928 he was elected chancellor of Oxford Univ., and in the same year suffered a bereavement in the sudden death of his wife, whom, as Lady Glenconner, he had married in 1922. Falling sight handicapped his later years. In spite of his undoubted gifts he was never happy in parl. life, he lacked the disposition which enjoys the fray and the prouidence. His other interests were angling, in which he was an acknowledged authority, tennis, at which he was a past champion, and wild bird sanctuaries. Author of *Fly-fishing* (1899); *Fallodon Papers* (1926), and *Churn of Birds* (1927). A mural plaque on the wall of the Foreign Office commemorates his name, as also the acquisition of Ross Castle for the nation. See H. Lutz, *Lord Grey and the World War* (trans.) 1928, and C. M. Trevelyan, *Grey of Fallodon*, 1937.

Grey, Sir George (1799-1882), Eng. statesman, the nephew of Earl G., the Liberal statesman. He was b. at Gibraltar, and was educated at Oriel College, Oxford. He represented Devonport in Parliament from 1832 to 1847, and became under-secretary for the colonies in 1834. He was appointed judge-advocate (1839), chancellor of the duchy of Lancaster (1841), and, during Russell's ministry, home secretary, (1846). He was not a brilliant speaker but showed much practical ability during the Chartist riots and the Fenian activity in Ireland. Under Lord Palmerston he was home secretary (1855), chancellor of the duchy of Lancaster (1859), and home secretary again in 1861. See memoirs by M. Creighton, 1884.

Grey, Sir George (1812-98), governor of New Zealand. He was b. at Lisbon, and educated at the Royal Military College, Sandhurst. He entered the army in 1829, and attained his captaincy in 1837, when he sent in his papers. From 1837 to 1840 he explored the N.W. region of Australia for the Royal Geographical Society, publishing the results of his travels in *Journals of Discovery in Australia* (1841). In that year Lord John Russell appointed him governor of S. Australia. He reduced the public expenditure, and showed such wisdom in his government of the young colony that in 1846 he was sent as governor to New Zealand, in order to conciliate the Maori



LADY JANE GRAY

chieftains, who were at the time in open rebellion. He succeeded in establishing peace and won the admiration of the natives. In 1854 he was appointed governor and commander-in-chief of the Cape of Good Hope, and had to use all his tact and firmness in allaying the discontent left after the Kaffir war. In 1858 however, the Colonial Office objected to some measures of G., who thereupon resigned office. Feeling in his favour was high at the Cape and he resumed office. In 1861 he was a second time sent to New Zealand to bring the native war to an end. He resigned in 1867 on some point of difference between himself and the Colonial Office, and entered the New Zealand Legislature in 1874, becoming premier in 1877. He advocated many reforms, including manhood suffrage, and had great influence with all parties. His pubs. include *Polyesian Mythology* (1856) and *Proverbial Sayings of the Ancestors of the New Zealand Race* (1858). See lives by W. Ross, 1892, and J. Collier, 1909.

Grey, Henry George, third Earl (1802-1894), Eng. statesman, b. at Howick, in

Northumberland. As Viscount Howick he entered the House of Commons, became colonial secretary (1846-52) in Russell's Cabinet, and pub. a defence of his colonial policy, entitled *Colonial Policy of Lord John Russell's Administration* (1853). He also wrote weighty letters to *The Times*, and an *Essay on Parliamentary Government as to Reform* (1858), and edited his father's *Correspondence with William IV.* (1867).

Grey, Lady Jane (1537-54), 'nine days' queen' of England and great-granddaughter of Henry VII. She was b. at Bradgate in Leicestershire. In 1553 the duke of Northumberland forced her into marrying his fourth son, Lord Guildford Dudley. On the death of Edward VI. she was proclaimed Queen Jane on July 10, 1553. Meanwhile Mary advanced upon London and Northumberland was too faint-hearted to oppose her. On July 19 Jane found herself a prisoner in the Tower, and on Feb. 12, 1554, was beheaded on Tower Hill on a charge of high treason. She was an exceedingly accomplished scholar, was well versed in feminine arts and was of a happy and gentle disposition. See J. G. Nichols' ed. of *The Chronicles of Queen Jane*, 1850; J. A. Taylor, *Lady Jane Grey and her Times*, 1908; and R. Davey, *The Nine Days Queen*, 1906.

Zane, Zane (1875-1939), Amer. author, b. at Zanesville, Ohio. Educated, Zanesville High School and univ. of Pennsylvania. Practised as dental surgeon in New York, 1898-1904; after that lived by literature—chiefly novels. Pub. more than fifty vols. Sport and the wild west, both of which he understood, form the staple of his writings—from *Betty Zane* (1904) to *Raiders of Spanish Peaks* (1938).

Greyfriars, church in Edinburgh which dates back to the fifteenth century. It was the scene of the betrothal of the Prince Royal of Scotland (afterwards James IV.) to Cecilia of England, 1471; and the National Covenant was first subscribed here, 1638, when the aggressive measures of Charles I. roused to arms the whole of Scotland. The church was desecrated by Cromwell's soldiers in 1650, and in 1679 its burying-ground was used as a prison for some of the unhappy Covenanters, the Martyr's monument bearing witness to the fact. A new church, since denominated New G., was built in 1721. Among distinguished incumbents was Wm. Robertson, the eminent historian, who was appointed in 1761. Sir Walter Scott, who from youth to manhood attended Old G., in his novel *Guy Mannering* introduces this old church and relates how, when Col. Mannering came to Edinburgh to consult Councillor Pleydell, the latter conducts him to 'the Greyfriars, to hear our historian of Scotland, of the Continent, and of America preach.' Old G. was destroyed by fire in 1845, but has since been repaired at a considerable cost. Its burying-ground contains the tombs of George Buchanan, George Heriot, Allan Ramsay, James Borthwick, Duncan Ban MacIntyre, and Sir Walter Scott's family.

Greyhound, breed of dogs of great antiquity, found from the earliest times in

E. Europe and Asia, while many Egyptian monuments are ornamented with unmistakable representatives of the modern G. They are characterised by their long and narrow muzzles, slight build, and elongated limbs, and small ears falling at the tips, but they differ greatly in the length of their hair. They hunt almost entirely by sight, the sense of smell being defective. The long, slender skull points to affinity with the wolf. The Eng. G. is the best known of the group, and has sometimes been regarded as the parent of the others. It can readily be distinguished from all other dogs by its slender form, smooth hair, and rat-like tail, as well as by its comparatively large size. It is thoroughly adapted for extreme speed, the long tail being used as a balance for the body during quick turns, while the slender limbs with wire-like muscles give the



GREYHOUND

F. Fall

greatest possible length of stride and offer the least possible resistance to the air. The favourite colour is a uniform sandy or pale grey tone, but the colour is of very little importance in comparison with the capacity for speed. The It. G. is kept purely as a pet and is a miniature of the Eng. variety; its proportions are most elegant and its speed considerable, but it is so delicately made that it is almost unable to pull down even a rabbit. The eyes are larger and softer than in the Eng. type, and the most valued are a golden-fawn in colour. The Scottish deerhound is a larger and heavier variety of the Eng. G., with rough and shaggy hair; it used to be employed both for coursing and deer stalking, and the twofold use has given rise to different strains of the breed. The Irish wolf-dogs are now extinct, but seem to have had characteristics of the G. Other varieties are the Grecoian, Persian, and Russian Gs., and sev. oriental types characterised by their silky hair. See H. Edwards Clarke, *The Modern Greyhound*, 1848.

Greyhound Racing, term generally used to describe a race of greyhounds in pursuit of a mechanical hare. Coursing (q.v.) is also a form of G. R. The sport first became popular in America, and then rapidly spread to other countries, though

It is claimed that the use of mechanical devices for greyhound races was practised in England long before the Amers popularised it. By means of a clever device a mechanical imitation of a hare is made to move around a track, and as it passes the starting post the competing hounds are simultaneously released. The races are usually over distances of about a quarter to a third of a mile, and as there is little chance of the dogs overtaking the 'hare,' the contest becomes a competitive race between the dogs. During 1926-27 this racing became extraordinarily popular in Great Britain, attracting not only the attention of sporting men, but also of company promoters. Complaints arose that many of the methods of fraud, which the Jockey Club had more or less successfully countered during many years on the horse-racing course, were practised with impunity in G. R., there being no body whose authority was sufficiently well recognised to prevent such attempts. These difficulties, however, were met by the use of more careful methods at the better-managed tracks and by the estab. of the National G. R. Association, under the control of a committee of persons who issued rules based on and similar to the regulations the Jockey Club insists upon in horse racing. This association issues licences to the proprietors of tracks, and although there is no necessity for the owners of a track to apply for a licence nor abide by the rules, the advantages of doing so are obvious. There are now race-tracks in nearly all the large Brit. cities, the best known in London being at the White City, Harringay, Wembley, and Wimbledon. The Totalisator (q.v.) has been installed in most places.

Greymouth, tn. and seaport of New Zealand at mouth of Grey R. in Westland Prov. It is the prin. centre of the W. coast of the South Is. for railway and tourist traffic. In the surrounding dist. the prin. industries are gold mining in all its phases, coal mining, and timber milling. As a result the export of coal and timber makes the port one of the busiest in New Zealand in point of tonnage. Its bar harbour has an average depth of 24 ft. at high water on the bar at ordinary spring tides, with an average depth of 22 ft. in riv. at high water. The bar has a public library, many hotels, a racecourse, recreation grounds, aerodrome, golf links, and tennis courts. The prin. industries of the tn. are brick works, foundry and engineering works, brewery and dairy factory. Pop. 9200.

Greynville, Sir Richard, see GRENVILLE.

Greys, Scots, famous Scottish regiment, and the only surviving distinctively Scottish cavalry regiment. It dates its origin from the religious troubles in Scotland during the reign of Charles II., when, owing to the growing opposition of the persecuted Covenanters, the Scottish Gov. deemed it advisable to increase its military strength. Accordingly three troops of Dragoons were raised in 1678 for the standing army, three more being added in 1681, when the whole six were regimented as the 2nd Regiment of

Dragoons, known later as the S. G., from the colour of the tunic. Their first colonel was the original commanding officer of the first troop, Sir Thomas Dalziel, the strange enthusiast who never cut his beard nor altered the fashion of his uniform from the time of the execution of Charles I. The regiment served in Flanders under William III. from 1694 to 1697, and in all Marlborough's famous battles. At Ramillies they assisted in the capture of the Fr. Régiment du Roi with its colours. They fought at Sheriffmuir and at Fontenoy, and won fame at Waterloo for an historic charge. After Waterloo came a long spell of inactivity, but in the Crimea they earned the special commendation of Sir Colin Campbell for their part in the charge of the Heavy Brigade at Balaclava under Sir John Scarlett. They were also in the Egyptian war 1881-83, and in the S. African war 1899-1902. In the First World War the S. G. were in the cavalry operations during the Mons retreat and in the subsequent advance from the Marne to the Aisne. Afterwards they fought more often as dismounted troops in the Ypres area, notably in the bitter fighting of Oct. 1914 around Gheluvelt. They were also among the troops which defended Hill 60, and in the fighting at Messines and Wytschaete, and on the Somme, both as mounted and dismounted troops, in the final Ger. offensive of 1918. In the Second World War the S. G. fought on the W. Front.

Greytown: 1. Called also San Juan del Norte, tn. and port of Nicaragua on the Caribbean Sea, at the mouth of the San Juan R. It is a port of call for mail packets, and monopolises the import and export trade of the country. The prin. exports are banana, coconuts, tortoise-shell, mahogany, India-rubber, and hides. The harbour, once very fine, is now badly silted up. A vast breakwater has been erected pending the construction of a Nicaraguan canal. Pop. 2500. 2. Tn. of Natal in the Umvoti valley, 65 m. S.W. of Pietermaritzburg. Pop. 1700.

Gribble (*Limnoria terebrans*), tiny Crustacean isopod, which rolls itself up like a woodlouse. It is common in European seas and has also been found in other parts of the world. It is disastrous to the timber of ships, burrowing into the superficial layers of wood and reducing them to a spongy mass which is easily washed away, thus exposing fresh layers to penetration. The damage done, however, is visible on the surface and is therefore less likely to reach serious proportions without being noticed than that caused by the shipworm (see TEREDO).

Griboyedov, Alexander Sergievich (1793-1829), Russian poet and dramatist, b. at Moscow. In 1826 he became minister-plenipotentiary to Persia, but in 1829 the populace of Teheran, inflamed against the Russian embassy, attacked the house and assassinated the minister. G. began his literary work with a comedy, *The Young Spouses*, in 1816, but his great work, *Goré of uma*, or *Misfortune from Intelligence* (Eng. trans. 1857), a satirical comedy upon Russian society, was re-

jeeted by the censorship and was not pub. until 1833. He left unfinished a romantic drama, *A Georgian Night*.

Grid, Map, see MAPS; NATIONAL GRID.

Grid System, network of conductors of electrical power estab. over Great Britain to connect the generating stations and facilitate the transfer of power at high voltages from one dist. to another. Power is transmitted at 132,000, 66,000, or 33,000 volts, and is reduced to lower voltages in the areas where it is to be used. Overhead transmission lines supported by pylons are used in open country, but in ins. the insulated conductors are carried underground.

Grieg, Edvard Hagerup (1843-1907), Norwegian composer and pianist, b. at



EDWARD GRIEG

Bergen, descended from an Aberdonian who left Scotland in 1779; his musically gifted mother, Gesline (née Hagerup) was descended from the Montrose family of Christie. Went to the Conservatoire of Leipzig for his musical education (1858-1862). When he returned from Germany he met Richard Nordraak, who was collecting and editing folk-songs, and it is in G.'s songs that we hear for the first time the music of the N. His Opus I, *Four Piano Pieces*, written during his last years in Leipzig, shows clearly that Schumann and Chopin were his ideals. Then followed sev. of his masterpieces: in 1865 the piano Sonata (Opus 7) and the violin Sonata in F (Opus 8); in 1868 he wrote what is perhaps his best composition, the piano Concerto in A minor (Opus 16)—a work instinct with beautiful themes, characteristic rhythm, and original harmony. In 1871 he founded the Musical Society in Christiania, of which he was for some years conductor. During that period he wrote his first *Lyric Pieces*,

the violin Sonata in G (Opus 13), the chorus *Landkending*, and the music to Björnson's *Sigurd Jorsalfar*. In 1874 G. was invited by Ibsen to write music to *Peer Gynt*. At the same time he wrote his second great piano work, the *Ballade* in G minor (Opus 24). At Loftus in Hardanger, whither he had now moved, he wrote four new masterpieces, the string Quartet in G minor (Opus 27), Album for male voices (Opus 30); *Den Bergtekne* (Opus 32); and *Vinje Songs* (Opus 33). Norwegian folk-melodies are the basis of his songs to the text of the poet A. O. Vinje. In 1880-82 he was leader of the Musical Society Harmonien in Bergen and produced further great works, including the famous *Holberg Suite*. Other dramatic works, besides the *Peer Gynt* music, include *Scener av Olav Trygvason* (Opus 50) and a melodrama *Brygoli* (Opus 42). By the eighties G. had become a world-renowned master. In 1888 he conducted for the first time in London and Birmingham, and in 1889 in Paris, and no doubt it was the *Peer Gynt* music that opened the way for him. G.'s music is intensely national in character and is mostly lyrical. His works for pianoforte solo include a great number of lyric pieces. In chamber music he wrote two indifferent string quartets. Of his three sonatas for violin and piano two rank among his finest achievements. Of his numerous songs the settings, particularly of Hans Andersen and Björnson, are exquisitely poetic. The *Lyric Pieces* are character-sketches in the spirit of Schumann, fresh in melody and with a sonorous ring. As examples may be mentioned Opus 12 (with *Folk-Song*); Opus 43 (with *Erotik*); Opus 57 (with *Nostalgia*); and Opus 68 (with *Erening i the Mountains*). G. married (1867) his cousin Niina Hagerup, a fine vocalist who with rare art brilliantly interpreted his songs. See E. Closson, *Edvard Grieg et la musique scandinave*, 1892; G. Schjelderup, *Edvard Grieg og hans værker*, 1903; H. T. Finch, *Edvard Grieg*, 1906; E. Eggen, *Edvard Grieg i Norges Musik-historie*, 1921; R. H. Stein, *Grieg*, 1921; and G. Abraham, *Grieg*, 1948.

Grierson, Sir George Abraham (1851-1911), Irish scholar, authority on the languages of India, b. at Glenageary, co. Dublin; eldest son of George Abraham G., LL.D. Educated at Shrewsbury and at Trinity College, Dublin, where he was Hindu-fan and Sanskrit exhibitioner. He was appointed a member of the Indian Civil Service, 1873, and after holding various gov. offices became director (1898-1903) and superintendent of the Linguistic Survey of India. His monumental *Linguistic Survey of India* (1899-1901) is the first complete and correlated account of the many languages of the Indian sub-continent and its N. confines, and in it are described and classified 179 languages and 544 dialects. The work has been the means of effecting an extraordinary change in the linguistic teaching of the Indian univs. He also made a close study of the religions, folk-lore, and mythology of India. Among his other publs. are *A Handbook to the Kaithi*

Character (1881, 1889); *Seven Grammars of the Bihari Dialects* (1883-84); *Bihar Peasant Life* (1885, with some valuable illustrations); *Modern Vernacular Literature of Hindustan* (1889); *The Sataiaya of Bihari* (1896); *Essays on Kashmiri Grammar* (1899); *Pisaca Languages of North Western India* (1906); and *Manual of the Kashmiri Language* (1911). K.C.I.E., 1912; O.M., 1928.

Grierson, Sir Robert (1655-1733), Laird of Lag, was the great persecutor of the Covenanters. He was especially active in helping to put down conventicles, and in enforcing the Test Act, using all kinds of severity to gain his ends. He succeeded, in fact, in making his name a byword for all that was cruel. He was also one of those to condemn the Wigtown martyrs. In 1685 he was made a Nova Scotia baronet. After the revolution he was several times fined and imprisoned. He is the original of Scott's *Sir Robert Redgauntlet*. See Lt.-Col. A. Fergusson, *Laird of Lag*, 1885.

Griesbach, Johann Jacob (1745-1812), Ger. biblical critic, b. at Butzbach in Hesse-Darmstadt. The great work with which his name is associated is his critical version of the text of the N.T. (1774-75), the most remarkable feature of which was his div. of the MSS. into three groups: (1) the Alexandrine recension; (2) the Lat. or W. recension; (3) the Byzantine or E. recension. His other works are *Synopsis Evangeliorum* (1774-75); *Populare Dogmatis* (1779); and *Opuscula Academica* (ed. J. Gahler) (1825). See also BIBLE. See life by F. Kothe, 1812.

Griesheim: 1. Small m.rkt. tn. of Hesse, Germany, about 5 m. W. of Darmstadt. Pop. about 7000. 2. Small tn. of Prussia, in the prov. of Hesse-Nassau, situated on the Main, about 4 m. W. of Frankfurt-on-the-Main. Pop. 7800.

Griffin, Gerald (1803-40), Irish novelist and dramatic writer, b. at Limerick. After great hardships he succeeded with *The Naiadés*, an opera entirely in recitative, in bringing himself into public notice. His tragedies were entirely unsuccessful, but he attained great popularity by the *Holland Tide Tales* (1827), followed by *Tales of the Munster Festivals* (1827) and the fine novel *The Collegians* (1829), which Dion Boucicault adapted for the stage under the title of *The Colleen Bawn*. Among his other novels are *The Invasion* (1832); *Tales of my Neighbourhood* (1835); *The Duke of Monmouth* (1836); and *Tudis Quialis*, or *Tales of the Jury-room* (1812). In 1838 he joined the Society of the Christian Brothers at Dublin, whence he removed to the N. monastery, Cork, where he d. of typhus.

Griffin, city of Georgia, U.S.A., 40 m. S. of Atlanta, and the cap. of Spalding co. Here is situated the state agrio. experiment station, and there is an important cotton and fruit trade. Pop. 13,200.

Griffin, or Griffon, mythological beast used in architectural decoration and as a charge in heraldry (q.v.). It is the oldest and most common of the outlandish monsters used as heraldic devices, having the hinder parts of a lion with the fore-

parts, head and shoulders, wings and forelegs of an eagle. When the head alone is borne it can be distinguished from that of the eagle by the long tuft under the beak and the pointed ears. The G. sergeant is supposed to have been taken as a quartering by the family of Montague at a very early date. The evidence for this statement is as follows. Sir Simon, first Lord Montague (d. 1316) quartered azure a t. sergeant Or in the Falkirk Roll, 1298 (Marl. MS. 6589, ff. 9, 9b). This is one of the earliest extant examples of a quarterly coat. He bore the same in the Carlaverock Roll, 1300 (Cott. MS. Calig. A. xviii., f. 23b-30b), and on his counter-seal attached to the Baron's letter to the pope in 1301 (Birch, Cat. Brit. Mus. Seals, No. 11851). It was not borne by any of his descendants.

Griffith, Arthur (1872-1922), Irish patriot; b. in Dublin; son of Arthur (i. printer. Educated at a Christian Brothers' school in Dublin. Became a compositor. Joined the Gaelic League when it was formed; also the Celtic Literary Society and the Irish Republican Brotherhood. Went to S. Africa, 1896, became a surface worker on the Rand. Returned to Dublin, 1898. With Wm. Rooney he estab. the *United Irishman* weekly in 1899, and on Rooney's death in 1901 he became its sole director. It was an unprofitable, brilliant, literary paper. G. at length left the I.L.B., and began to preach a policy of passive resistance to Brit. rule in order to obtain dominion status for Ireland. In Oct. 1902 an organisation based on his policy, and called Cumann na Gaedhal, was founded — with the watchword 'Sinn Féin' (pronounced, approximately, *Sin Fane*), or 'We ourselves'; in other words, Direct Action: it soon became the name of the party. The movement progressed rapidly in Dublin; it was slower in taking hold of the country. Libel actions and other incidents caused repeated changes in the name of the paper G. directed. In 1906 it became *Sinn Féin*, which for a little while was a daily. Next it was *Eire*. On the rise of the Irish Volunteers as a counter-stroke to the Ulster Volunteers, G. was active on their side, and assisted in the gun-running at Howth in July 1914. *Eire*, suppressed, was succeeded by *Scissors and Paste*. Although G. took no part in the rising of Easter 1916, he was interned with the leaders of that revolt at Frongoch, Wales. In July 1917, when he and they were again at liberty, de Valera was elected leader of *Sinn Féin*, on the motion of G. G.'s paper came out again as *Nationality*, and again as *Eire Óg* (Young Ireland). While they were undergoing a term of imprisonment in 1918 de Valera and G. were elected president and vice-president respectively of an Irish republic. The terrorist period of the Black and Tans followed. G. was again in prison in 1920. During de Valera's absence in America, 1919-20, he was head of the republic and had a prominent share in the settlement of the Irish question in 1921. He was elected first president of the Irish Free State (q.v.). When Dáil

Eireann had declared for the treaty, G. had the task of suppressing the rebellion of irreconcilables. Just when he had succeeded in this he fell in a faint when leaving a private hospital in Lower Loeson Street, Dublin; he was carried back and d. there an hour or so later, Aug. 12. He wrote no book; but a pamphlet of his, *The Resurrection of Hungary* (1905), must have stimulated the national movement in Ireland.

Griffith, William (1810-45), Eng. botanist, b. at Petersham, Surrey. His first public work appeared in Dr. Wallich's *Plantes Asiatica rariores* in 1832; in the same year he was appointed assistant-surgeon in the service of the E. India Company. His most important papers were pub. in the *Transactions of the Linnean Society*, and his books, *Icones Plantarum Asiaticarum Itinerary Notes*, *Palms of British East India*, and *Notulae ad Plantas Asiaticas*, were pub. by J. MacClelland after G.'s death.

Griffon Bruxellois, toy dog of terrier extraction bred in Belgium, with a rough coat, the smooth dog of the same breed being the 'petit Brabançon.' It was introduced into England in 1895. The points of the G. B. are general appearance intelligent, sprightly, robust, and compact; head large and rounded, covered with rather coarse, rough hair; ears semi-erect when not clipped; eyes very large and black; eyelashes and eyebrows finished with long stiff black hair; nose short, black, surrounded with hair and converging upwards to meet the hair round the eyes; lips edged with a black moustache; chest rather wide and deep; legs of medium length and very straight; tail upwards, colour red; harsh and wiry coat; weight, small size, maximum, 5 lb., large size 10 lb.

Grigoresco, Nicolae Ion (1843-1907), Rumanian painter, b. near Tîtu, N.W. of Bucharest. He became famous during the Russo-Turkish war (1877-78) by his fine military pieces, notably 'The Storming of Smârdan,' which is in the tn. hall at Bucharest, and 'Provision Transport in Bulgaria,' in the museum of Bucharest. His portrait of 'Carmen Sylva' is a fine, spirited achievement.

Grigoropol, tn. of the Ukraine, in the region of Kherson. It is situated on the Dniester R., 80 m. N.W. of Odessa. There is a trade in wine, fruit, and tobacco, and fine leather is manufactured. Pop. 9000.

Grilling, *s. under COOKING*.

Grillparzer, Franz (1791-1872), greatest dramatic poet of Austria, b. at Vienna. In 1813 he was appointed a clerk in the Lower Austrian revenue administration. In 1818, through the influence of the minister of finance, he was appointed poet to the Hofburg Theatre, and was promoted to the Hofkammer (Exchequer). In 1832 he was made director of archives of the Hofkammer, from which he retired with the title of Hofrat in 1856. He first attracted attention by his tragedy *Die Ahnfrau* (1817), a 'fate-drama' in the trochaic measure of the Sp. drama. In 1818 appeared *Sappho*, a drama in the classic spirit of Goethe's *Tasso*, followed by the trilogy *Das goldene Vlies* (1821),

comprising *Der Gastfreund*, *Die Argonauten*, and *Medea*, all noble pieces of work, modern in sentiment, and classical in design. His historical tragedies *König Ottokars Glück und Ende* (1823) and *Ein treuer Diener seines Herrn* (1826) first brought G. into conflict with the censor, a struggle which helped to embitter all this period of his life. With *Des Meeres und der Liebe Wellen* (1831), a dramatisation of the story of Hero and Leander, he returned to the classical themes and the style of *Sappho* with an even greater measure of the Sp. grace of expression, which he borrowed mainly from Calderon. *Der Traum, ein Leben* (1834) is his technical masterpiece and the first of his dramas without a tragic ending. His only attempt at comedy, *Wch dem, der Lust* (1838), in spite of its brilliance, failed to meet the popular taste and disgusted him for ever with the Austrian theatre. Three unpublished tragedies, *Die Julin von Toledo*, *Ein Bruderzwist in Habsburg*, and *Libussa*, were found among his papers after his death. Although essentially a dramatist, his lyric poetry is of fine quality, and he left one prose masterpiece, *Der arme Spielmann* (1848). See H. Lanbe, *Franz Grillparzers Lebensgeschichte*, 1884; A. Elbhard, *Franz Grillparzer*, 1900; G. Polluk, *F. Grillparzer and the Austrian Drama*, 1907; H. von Hofmannsthal, *Grillparzers politische Vermaehnisse*, 1915; and F. Stori, *Grillparzer und Kant*, 1935.

Grilse, *see SALMON*.

Grimald, Nicholas (1519-62), Eng. poet and theologian, b. in Huntingdonshire and educated at Cambridge. He became a probationer fellow of Merton College, Oxford, in 1541 and chaplain to Bishop Ridley in 1547. His connection with Ridley led to his imprisonment, and he is said to have escaped only by recanting. It was at Ridley's desire that G. trans. Laurentius Villa's book, the alleged *Donation of Constantine*, also *Enones Sylvestri de gestis Basiliensis Concilii*. He is best remembered by his contributions to Tottel's *Songes and Sonettes* (1557), although for some reason thirty of his forty poems were suppressed in the second ed. His poetry was modelled on Surrey's, but is inferior to it. There are two Lat. tragedies of G.'s still extant: *Archiphilo* sive *Johannes Baptista* (1548) and *Christus redemptus* (1543); and trans. of Cicero's *De officiis* and Virgil's *Georgics*.

Grimaldi, Francesco Maria (1619-63), It. Jesuit and natural philosopher, b. at Bologna. He wrote a valuable work entitled *Physico-mathesis de Lumine, Coloribus, et Iride, aliisque annexis* (1663), which contains accounts of numerous experiments relating to the interferences of the rays of light. This phenomenon of interference was at the time enunciated as a proposition: 'That a body actually enlightened may become obscure by adding new light to that which it has already received.' He was also the discoverer of 'diffraction' of light, afterwards designated 'inflexion' by Newton, who also corrected his theories of the different refrangibilities of the rays.

Grimaldi, Giovanni Francesco (1606–80), It. architect and landscape painter, sur-named 'Il Bolognese' from his bp. He was a relative and pupil of the Caracol. He became architect to Pope Paul V., and was employed by Cardinal Mazarin and Louis XIV. upon architectural designs and fresco-painting in the Louvre.

Grimaldi, Joseph (1779–1837), the most famous of Eng. clowns, b. in London, the son of an It. actor. His father was nearly seventy when G. was b., and tradition has it that he beat his son unmercifully in the course of training him for the stage. He first appeared at Sadler's Wells as an infant dancer in 1781, and in the same year he took part in the pantomime at Drury Lane. When G. was nine his father d., and in the circumstances G. was allowed to act both at Drury Lane and at Sadler's Wells on the same evening. When he was fifteen Drury Lane paid him £2 a week and Sadler's Wells £4; yet he still found time to help in an uncle's butcher's shop. When nineteen he married the daughter of one of the proprietors of Sadler's Wells, but she died very soon afterwards. Four years later he married a Drury Lane actress. His health gave way at the peak of his fame and he was a cripple by forty-five. Finally he was dependent on charity. His greatest success was in *Mother Goose* at Covent Garden in 1806; a part which he constantly revived until his last performance in March 1828. G. was a creative artist, whose humorous effects were achieved by ceaseless labour and thought. See his memoirs, ed. by Charles Dickens, 1838.

Grimm, name of two brothers, distinguished Ger. philologists and storiologists, both b. at Hanau, and fellow students in law at Marburg Univ.

Jakob Ludwig Karl (1785–1863) began his literary career at Paris (1805) as assistant to Prof. Savigny, a celebrated Ger. jurisconsult, the founder of the 'historical school' in Germany. This work enabled G. to gain valuable insight into the 'scientific method' he later pursued in his investigations of the Teutonic languages, which led to his becoming the founder of scientific philology and to his epoch-making discovery known as *Grimm's Law* (q.v.), enunciated in his *Deutsche Grammatik*, the greatest philological work of the age. While librarian at Wilhelmshöhe and then at Kassel he was able to carry on his favourite studies of philology and of old and medieval Ger. poetry. In 1811 he pub. his first work in the latter subject, *Ueber den Altedutschen Meistersang*. During 1827–37 he was lecturer in the Ger. language, literature, and antiquities at Göttingen Univ. Later he became lecturer at Berlin Univ. His *Kinder- und Hausmärchen*, collected and pub. with his brother, made fairy-tales popular throughout Europe, and gave rise to the investigations which establish the modern science of Folklore. The brothers G., in their quest for old stories, went to medieval MSS. and folk-books and, above all, took down from dictation what Ger. peasants remembered of the old tales. Of

all the people from whom they collected stories it is Frau Katharina Viehmann who is most remembered. She was the wife of a tailor of Niederwehren, near Kassel, about fifty-five when the brothers first met her, and in the words of Wilhelm, 'retains fast in mind these old sagas, a talent which, as she says, is not granted to every one... She recounts her stories, thoughtfully, accurately, with uncommon vividness and evident delight.' The first collection of their book of tales was pub. in 1812 (new complete ed. trans. by Margaret Hunt, illustrated by Joseph Scharli, 1949). His *Deutsche Rechtsalter-tumer und Mythologie* treat of the society and religious superstitions of Central Europe in the Middle Ages. G. stands out among scholars for his stupendous learning and disinterestedness.

Wilhelm Karl (1786–1859) was assistant librarian at Kassel and prof. extraordinary at Gottingen. At Berlin he collaborated with his brother. He wrote independently *Die Deutsche Heldenage, Kampf-Lied*, and many treatises on Ger. literature and antiquities. See also trans. of their works by L. Crane, 1882, and M. Hunt, 1884, with an introduction by A. Lang. See E. Tonnelat, *Les Contes des frères Grimm*, 1912.

Grimm, Friedrich Melchior, Baron von (1723–1807), witty Ger. writer, b. at Ratisbon and educated at Leipzig. In 1749 he made the acquaintance of Rousseau, and became closely associated with the Encyclopedists. In the musical war between the partisans of Fr. and It. music G. sided with the latter and wrote in their defence a witty pamphlet, *Le Petit Prophète de Boehmischesbroda* (1753), followed by *Lettres sur la musique fran-çaise*. On becoming secretary to the duke of Orleans he wrote, in conjunction with Diderot and Abbé Ragnal, literary bulletins containing acute criticism on Fr. literature. In 1776 he was appointed minister to the Fr. court by the duke of Gotha, and in 1795 as minister of Russia to Hamburg by the Empress Catherine. His *Correspondance littéraire, philosophique, et critique* was published in 1812.

Grimma, tn. in Saxony, Germany. It stands on the l. b. of the Mulde and is about 17 m. S.E. of Leipzig. Here is the Fürstenschule, a school founded in 1530. The people are chiefly engaged in the manuf. of iron goods and in agriculture. Pop. about 12,200.

Grimmelshausen, Hans Jakob Christof von (c. 1625–76), Ger. author, b. at Gelnhausen in Hesse-Cassel. As a boy he was kidnapped by Hessian soldiers, and becoming a soldier himself fought on the imperial side in the Thirty Years war. At the end of the war he settled at Renchen in Baden, and entered the service of the bishop of Strasbourg, becoming *Schultheiss* (magistrate) of Renchen in 1665. He devoted his leisure to literature and pub. nov. remarkable novels. In 1669 he pub. *Der abenteuerliche Simplicissimus*, a work which is modelled on the picaresque romances of Spain and is largely autobiographical in its descriptions of the stirring scenes of the hero's child-

hood. Among his other works are *Simplicianische Schriften*; *Die Erdbetrügerin und Landstörlein Courasche* (c. 1869), *Der seltsame Springinsfeld* (1870), and *Das wunderbare Vogeinest* (1872). His satires and gallant novels, modelled on *Cyrano de Bergerac*, such as *Dietwald und Amelinde* (1870), are very inferior to *Simplicissimus*. See *Simplicissimus* (ed. by A. von Koller, 1854, and H. Kurz, 1863-64).

Grimm's Law. Important phonetic law which states the changes in the consonants of words in the course of their development from the Primitive Indo-European language into Low and High Ger. The various languages of the Indo-European family show that, as they developed from the original language, each into its own special form, their consonants and vowels underwent change according to a certain

The most important consonant changes by which Primitive Ide developed into Germanic are summed up in the formula known as G. L. from the Ger. philologist Jacob Karl Ludwig Grimm (1785-1863), who first worked out the law, although it was not he who discovered it, this law being already suspected by the Dan. philologist Rasmus Christian Rask (1787-1822). It is now known that G. L. was stated by Grimm in a form no longer admitted as exact. This law, which takes into account the 'permutation of consonants' of the first shifting, states that the Indo-European *bh*, *dh*, *gh* (the 'voiced aspirates') ultimately became in Germanic *b*, *d*, *g* ('voiced stops' or 'mediae'), that *b*, *d*, *g* became *p*, *t*, *k* ('unvoiced stops' or 'tenues'), and that *p*, *t*, *k* became *f*, *þ* (*th*), *h* ('unvoiced spirants'); the *h* is like *ch* in *loch*.

	Sanskrit	Greek	Latin	Gothic	Old High German	German	English
<i>bh</i>	bhrātr̥	φράτηρ	frater	brōtar	bruoder	Bruder	brother
<i>dh</i>	rudhira	ερυθρός	ruber	rauds	rot	rot	red
<i>gh</i>	stighnōti	στέγω	-	stelgan	steigen	steigen	styke
<i>b</i>	-	-	tribus	þaúrp	dorf	Dorf	horp
<i>d</i>	dam	δαμίω	domare	tamjan	zamjam	zähmen	tame
<i>g</i>	jānu	γέννω	genu	knlū	kniu	Knie	knee
<i>p</i>	pāda	πούς	pes	fotus	fuoz	Fuss	foot
<i>t</i>	tri	τρέις	tres	þreis	dri	drei	three
<i>k</i>	kampata	κωπή	capere	hafjan	heffan	heben	heave

law. Knowing this law, the philologist can take a word from an early Ide tongue and say beforehand in what form that word will be found in any one of the languages descended from it in Sanskrit, Lat., Gk., or Germanic. The vowel or consonant of the word will have undergone a regular and known metamorphosis. He could predict, for example, that *bhrātr̥* in Sanskrit would be in Gk. φράτηρ, in Lat. *frater*, in Gothic *brōtar*, in Ger. *Bruder*, and in Eng. *brother*. The Germanic languages which Grimm investigated differ from Primitive Ide much more in their consonants than in their vowels, and these consonants it is with which G. L. is concerned. The Primitive Germanic system of consonants is best seen in Gothic, the most ancient of the Germanic languages, in Early Low Ger., and in Early Scandinavian. The Primitive Ide consonantal system is seen, with little deviation, in Sanskrit, Gk., Lat., Lithuanian, Old Slavonic, and Old Celtic. The Germanic languages underwent their characteristic changes at two more or less definitely marked epochs. The first, known as the *First Consonant Shifting*, took place in prehistoric times, the *Second Consonant Shifting* belongs to the fifth, sixth, and seventh centuries. In the latter certain Primitive Germanic consonants underwent a change as the words in which they occurred entered the High Ger. dialects. A word beginning with *s t* in Gothic, for instance, would change this *t* for a *s* (pronounced *ts*) in High Ger. Gothic, which underwent only the first consonant shifting, is the best representative of the Low Ger. and Scandinavian dialects; Old High Ger. the best representative of the other divs. of the Germanic languages.

The Amer. philologist Wm. Dwight Whitney believes that these changes, so arbitrary in appearance, have a physiological basis. They arise in the course of what Max Müller calls 'dialectic growth', similar to that instanced in the word *vat*, in wine-vat, which is the O.E. form of the N. Eng. *fat*, a vessel, and in such a dialectical change as that of *he liveth* into *he tires*, where the aspirate dental *th* becomes *s*. See R. Morris, *Historical Outlines of English Accidence* (London), 1872, revised by L. Kellner (London), 1895.

Grimsby, seaport in Lincolnshire, England, on the S. bank of the Humber, 15 m. S.E. of Hull, and the largest fishing port in England. In 1860 the total number of fishing vessels using the port was 60 (sailing) and the fish sent by rail 96,840 cwt.; in 1880, following dock improvements, the figures were 587 sailing vessels and 938,620 cwt.; in 1909 the total number of vessels was 608 (29 sailing and 579 steam) and the fish dispatched amounted to 3,519,300 cwt. The present fishing fleet comprises 350 steam trawlers, the largest of which are over 1000 tons dead weight. G. trawlers fish as far afield as the Faroes, Iceland, Bear Is., and the White Sea. The three fish docks cover 64 ac. of water and the pontoon or covered fish market, 14 m. long, has overall access to the railway for handling and dispatching catches. The ann. average value of fish landed at G. was, before the Second World War, between £3,000,000 and £4,000,000. In 1945 the 2,143,455 cwt. of fish landed were sold for £7,953,038. Ancillary industries to the fishing fleet include ship repairing and shipbuilding, marine engineering, net, rope, and twine making, box making and cooperage, ice

manuf. and cold storage, fish salting and curing and processing, preparation of fish meals and fertilisers, and ship's husbandry. While G.'s staple industry is fishing, there are other well estab. industries in the tn.; these include saw-mills, animal foods and medicines, biscuits, bituminous paints, brick tiles and clayware, chemical products, flour, iron and alloy castings, jam and preserves, light cars, paper and newsprint, plastics, wood-work, and furniture.

There are many fine old buildings, including a par. church and some interesting Rom. remains. The first tn. hall, a substantial 'mud and stud' structure built by the burgesses in 1394, stood for nearly four centuries until 1780, when it was replaced by a brick building which was demolished in 1863 and the present tn. hall erected on a new site. The site of the par. church of St. James is still marked by the three St. Mary's Gates, W., S., and E. St. James was entirely rebuilt, probably between 1190 and 1225, in the prevailing Early Eng. style. A drastic 'restoration' was carried out in 1718, when the transepts became a thoroughfare from High Street to Deansgate, and mayoral elections took place in the building. Finally in 1858 Canon Ainslie, as vicar, began the work of true restoration, which was carried on by his successors up to 1928. The church was bombed by Ger. planes on July 11, 1943, but the solidity of the work of the medieval builders as a whole withstood the blast. Of Willow Abbey, which stood $\frac{1}{2}$ m. to the S. of the church, hardly a vestige remains. The present free grammar school dates back to the Tudor period, when Edward VI. granted a charter for its foundation or its re-foundation, as there was already a school there in the fourteenth century. Friargate Crossing, by its name, is an indication that the Austin Friars had a house there. The Franciscans, Grey Friars, had their house in what is now Haven Street, the home of Gervase Holles, the seventeenth-century antiquary. The Templars had a preceptory in Bargate. Notable institutions are the College of Further Education, a centre of co. college activities; the Technical Secondary School; the G. Nautical School (1922), which replaced the Fisherlads' Institute of 1879 and which has five main dep'ts.: senior navigation, junior nautical, marine engineering, marine cookery, and deep-sea fishing; and the School of Art (which is also the home of the N. Lincolnshire Art Society). There are also a free public library and a mechanics' institute.

The name of G. is of Dan. origin, meaning 'Grim's town.' The story of Havelok and Grim, first related by Peter of Langtoft, a late thirteenth-century writer, is purely legendary. The story goes that Grim or Gryme was a poor merchant who rescued a baby whom he found deserted by the wayside. He brought him up and later found that he was the son of a Dan. king, Birkabーン (no such king is known), by whom he was richly rewarded, and so founded the tn. of G. in memory of his foster son. Evidently the facts are that one of the leaders of the invasion or of the

early settlers bore the not uncommon name of Grim and bequeathed it to his Eng. home. The actual recorded hist. of G. began in 1087 with the Domesday Survey, when the township was divided between Odo, bishop of Bayeux, Ralph de Mortimer, and Drew de Beurero. Richard I. held a meeting here (as recorded in the Black Book of the Admiralty) probably in April 1194, which indicates that it was then the main port on the Humber. King John granted its first charter for fifty-five marks of gold. In 1319 Edward II. granted a charter allowing the burgesses to hold two fairs and to have their own jail and assizes. The prosperity of G. in the Middle Ages did not continue uninterruptedly. Frequent references to the silting up of the haven and the consequent decay of the tn. occur throughout Tudor and Stuart times. The first change for the better came in 1800 when the new dock was opened under an Act of Parliament for enlarging and improving the haven. In 1849 Prince Albert laid the foundation of the Royal Dock, the outcome of the amalgamation of the old G. Haven Company with the Manchester, Sheffield, and Lincolnshire Railway Company which extended the line to G. in 1848. After the opening of the Royal Dock in 1852 the spectacular rise of G. began, when the fishing industry was started with a few trawlers, and the corporation laid out roads in the E. marsh. During the next half-century G. became the foremost fishing port in the world. In 1912 a new commercial dock was opened at Immingham, 6 m. up riv., to relieve the congestion in the docks at G. and the new fish dock, a development that was retarded by the First World War, was eventually opened in 1934. In the Second World War G. was a naval base of some slight importance, and on some twenty-eight occasions missiles were dropped on the tn.; but the losses were comparatively slight—124 civilians killed and 547 premises destroyed. Churches, schools, and the tn. hall were damaged, the public library partially demolished, and many business premises damaged or destroyed by fire. The tn. returns one member to Parliament. Cleethorpes, $3\frac{1}{2}$ m. S.E. of G., is a well-known health resort. Pop. (estimated), 66,000. See G. L. Alward, *The Sea Fisheries of Great Britain and Ireland*, 1932, and M. Graham, *Fish Gate*, 1943.

Grimmeli Pass, situated in the Bernese Alps, Switzerland. It is over 7000 ft. high, and leads to the valley of the Aar, being crossed by a carriage road. At the foot of the pass is the G. Ho-pice. It was here that the Fr. were victorious over the Austrians in 1799.

Grimsound, relic of an anct. strong-hold on Dartmoor, Devonshire, near the vil. of Hamilton Down. It consists of a score of stone huts within a stone wall about 5 ft. high. It is said to be an example of an Early Bronze Age vil. camp-dwelling, and is a unique specimen.

Grimthorpe, Edmund Becket, Baron (1810-1905), a famous authority on architecture and horology, was the designer of

Big Ben, the great Westminster clock. He was b. at Carlton Hall, near Newark, educated at Eton and Cambridge, was called to the Bar, and became a Q.C. in 1854. He was for some years a leader of the parl. Bar. He was much interested in architecture, designed sev. churches, and was responsible for restoring St. Albans Cathedral.

Grin, Henri Louis, see DE ROUGEMONT.

Grindal, Edmund (1519-83), Eng. divine; a prebendary of Westminster under Edward VI.; lived on the Continent during Mary's reign, embracing the teaching of Geneva; returned on Elizabeth's accession. Bishop of London, 1559; archbishop of York, 1570; of Canterbury, 1575. His Puritan sympathies were not shared by the court and he declined to suppress private meetings of the clergy for scriptural study, and he was accordingly sequestered. Writings and life were printed by the Parker Society, 1853.

Grindelwald, vil. situated in the canton of Berne, Switzerland, and in the Bernese Oberland. Here are the upper and lower G. glaciers, and the beauty of the spot attracts a large number of visitors. It is connected by rail with Interlaken and Lauterbrunnen. Pop. 7000.

Gringore, or Tiringoile, Pierre (c. 1475-1514), Fr. poet and dramatist, b. at Caen. He began his literary career by writing allegorical and moral poems, afterwards writing for the stage, his works containing satires on the politics of the time. He was for many years a member of the Enfants sans Souci, a theatrical company of Paris, and in his comedies attacked all people of all ranks, including the pope. His latter years were spent in the service of the duke of Lorraine, during which time he wrote religious poetry. His chief works are *Le Jardin du Prince des Sots* (1511), in which he satirised Pope Julius II.; *La Chasse du cerf des cerfs* (about 1520); *Le Mystère de Saint-Louis* (about 1521); and *Heures de Notre Dame* (1524). See E. Badel, *Pierre Gringoire*, 1892.

Grinnell, city of Iowa, U.S.A., in Poweshiek co., 55 m. N.E. of Des Moines. Manufactures, include carriages, flour, gloves, etc. Pop. 5000.

Grinnell Land, E. central part of Ellesmere Is. in Arctic America, a mountainous, mainly ice-covered tract, where foxes and reindeer are found. Kennedy Channel and Kane Basin separate it from Greenland.

Grinstead, East, tn. in the co. of Sussex, England, just over 30 m. to the S.E. of London and about 14 m. N.E. of Horsham. Here are situated Sackville College, founded 1608, and the St. Margaret sisterhood. It has a fine old par. church. Pop. 11,100.

Griqualand East, dist. of Cape Prov., S. Africa, lying to the S. of Natal. It has an area of over 7500 sq. m. It is part of the Transkeian Ter., which, although they contain many European farms in certain dists., mainly in G. E., are for the most part a native reserve, the Europeans in the majority of rural areas being almost exclusively traders. Adam Kok,

the Griqua chief, originally settled here, bringing with him 15,000 Griquas in an historic trek over the Drakensberg during which the Griquas were constantly harassed by warlike Basutos (see Carel Birkby's *Zulu Journey*). Since 1875 under the administration of Cape Prov. The chief tn. is Kokstad. Pop. about 270,000 (European pop. 8000).

Griqualand West, situated to the N. of Cape Prov., is bounded E. and S. by the Orange R. and N. by Bechuanaland. In 1870 a party of prospectors discovered the rich ground afterwards known as Natal Kopje, which marks the start of the diamond industry in S. Africa. This ter. was proclaimed in 1871 as the crown colony of G. W., and a sum of £90,000 was paid to the Orange Free State by way of compensation. From this time people flocked to the colony and the pop. rose to 50,000 in the first year, though it was of a very 'floating' character. In 1880 G. W. was incorporated with the Cape Colony, which was merged in the Union of S. Africa, 1910.

Griselda, fictional character whose conduct typifies wifely obedience. She was a very beautiful Piedmontese peasant girl wooed by the marquis of Saluzzo. She became his wife, and to assure himself of the worth and the stability of her character he put her to the severest ordeal, through all of which she passed successfully. After which, confidence completely restored, they were reconciled and happy. The origin of the story was Boccaccio's *Decameron*. Petrarch also used it and Cl. vicer in his *Clerkes Tale*. In all parts of the Continent versions of it are found and it has formed the subject of sev. plays, Fr., Ger., and Karly Eng.

Grisi, Giulia, or Julia (1811-69), famous It. soprano prima donna, b. at Milan. She studied under Giacomo Giaconelli, and made her first public appearance there in the part of Emma, in Rossini's *Zelmira*. She visited Florence, Paris, and London, winning universal fame. Sev. operas were written especially for her, including Bellini's *Puritani*; but the role in which she obtained her greatest triumphs was that of Norma. In 1856 she married Mario, a tenor, and toured with him in America. The tour was not a success and she returned to Europe. Her triumphs, her friendship with Théophile Gautier, and her peaceful old age are recorded in the life by Lafar (1948).

Gris Nez (Fr. 'grey ness'), cape in the dept. of Pas de Calais, France, in the point on the Fr. coast nearest to Britain. It is midway between Calais and Boulogne, and opposite Dover.

Grisons (Graubünden), largest canton of Switzerland, is bounded on the E. and S. by the Tyrol and Lombardy. It is a wild mountainous dist. intersected by narrow valleys. It includes the upper valley of the Rhine, and c.v. glacier groups. The valleys are fertile and cattle rearing and agriculture are the chief pursuits of the inhab. Iron, lead, and copper are found in small quantities and there are mineral springs. The name (from Graubünden,

the Grey League) is derived from the grey coat worn by the people of the canton who formed a league in the fifteenth century to resist the tyranny of the nobles. The cap. is Chur, and Davos, St. Moritz, and Arosa are popular pleasure resorts. Area 2746 sq. m. Pop. 128,200.

Grits, coarse sandstones, often very impure. Examples occur in the Greywackes and the Torridonian sandstones of Scotland and Wales. Millstone grit is the fourth member of the Upper Carboniferous series and is situated between the Lower Coal Measures and the Pendle-side group. It varies from 4000 ft. thick in Lancashire until it becomes very unimportant in Scotland. In S. Wales it consists of sev. layers, the top of massive sandstones termed 'Farewell Rock' by the miners, because no workable seams of coal lie below it. Pennant grit of the same dist. is a hard grey felspathic sandstone, cut as a freestone and used for building purposes. Kinnercote grit, so named from the Peak of Derbyshire, is the lowest div. of the Millstone grit of that area, while Rosslyn sandstone of Scotland is still another local development.

Grivegnée, tn. of Hesbaye and suburb of Liège, 2 m. to the S.E. of the city, on the R. Ourthe. There are coal-mines and important iron works, foundries, and manuf. of earthenware. Pop. 18,400.

Grizzly, see BEAR.

Groat (from the Dutch, 'great' or 'thick'), name applied in the Middle Ages to all large thick coins. The Eng. G. was first issued in 1351 and discontinued in 1662. It was a silver coin equal in value to fourpence. In 1336 a coin of similar value was struck, the fourpenny piece.

Grock (b. 1880), modern clown, whose real name was Adrien Wettach, b. at Reconville, son of a Swiss watchmaker. He early sought work in a circus, doing everything and anything, being by turns fiddle, pianist, cashier, mime, and acrobat—but always the philosopher with a yearning for music. He is remembered by many for his diminutive fiddle, his quaint antics with a grand piano, his thin dwindling shanks, and generally unique drollery. He is said to have amassed a considerable fortune by his performances. See M. Wilson Fisher, *Clowns and Pantomimes*, 1930.

Grodok, a tn. in Galicia, Ukraine, 16 m. W.S.W. of Lvov, is a great flax-growing centre. Pop. about 13,000.

Grodno: 1. Formerly also Gardinas, a region of the Byelorussian S.S.R., formerly Lithuania. It is low and marshy, and there are extensive pine forests. The principal rvs. are the Niemen, Bug, and Narev. Rye, flax, hemp, barley, and potatoes are grown; the chief industries are cloth, leather, bricks, and tobacco manuf. 2. Tn., cap. of above, on the Niemen, 80 m. S.S.W. of Vilna. It contains two castles, one dating from the twelfth century; the other, quite modern, was turned into a military hospital. Here the second partition of Poland was arranged, 1793, and in 1795 it was taken over by Russia. The fortress of G. was taken by the Gers. in 1939. In Chernyakhovsky's advance

across the Niemen (July 1941) his left wing joined with Zakharov's right in a converging move on G., and the fortress fell to the Red Army on July 16 after a three-day fight. Pop. 50,000.

Groggy Lameness, see NAVICULA DISEASE.

Groin, architectural term signifying the angular curve made by the intersection of two arches; when the intersecting arches have the same diameter and height, the G. is said to be regular; when one is semi-elliptical and the other semicircular, the G. is irregular. In Gothic architecture the G.s. are always ribbed.

Grolier, Jean, Viscount d'Agusy (1479-1563), Fr. bibliophile and connoisseur of book-bindings, was b. at Lyons. He entered the diplomatic service under Francis I. and spent some time in Milan and Rome. There he gradually collected a unique library of richly bound vols., devoting a great part of his fortune to it. In 1575 the collection was sold publicly, realising very high prices. Part of it is in the National Library, Paris, and a few vols. are in the Brit. Museum.

Grolier Club was founded in New York in 1884 with the object of encouraging the art of bookmaking. Lectures and exhibitions are given, and a number of works have been pub. by it. It has a library and reading-room.

Groningen: 1. Most N. prov. of the Netherlands, bounded N. by the North Sea, S. by the Drente, E. by Hanover, and W. by Friesland. It is very low and includes much reclaimed marshland. The soil is fertile and well cultivated, and agriculture is the prin. industry of the people. On the coast fishing and shipbuilding are carried on. Pop. about 147,400. 2. Cap. of the prov. of G., on the Hunze, 92 m. N.E. of Amsterdam, is the most important tn. in the N. of Holland. Connected by canals with the Dollart and (IJsselmeer) Zuider Zee, it forms a good centre for trade. It possesses a univ., botanical gardens, a museum, and tn. hall, and is well laid out. The chief industries are linen and woollen manuf., tobacco, and boat-building. G. was occupied by the Gers. in 1910. Ger. resistance in N. Holland collapsed before the advance of the Canadian Army (April 1945), the Gers. at G. surrendering on April 16. Pop. 131,000.

Gronovius, name of a family of scholars who settled in Holland. They were of Ger. extraction, their name being Gronov, of which the above is a latinised form. The prin. members of this family were:

Johann Friedrich Gronovius (1611-71), b. at Hamburg. He was at first a prof. at Deventer (1642), and afterwards at Leyden (1658). His knowledge of the classics and of antiquities was profound. He ed. Livy, Tacitus, Plautus, Cicero, and the works of many other writers.

Jacobus Gronovius (1645-1716), son of the preceding, was b. at Deventer. He also was a great scholar, and was first a prof. at Pisa and then at Leyden from 1679 till his death. His chief work was *Thesaurus antiquitatum Graecorum* (1697-1702), although he ed. sev. of the classics.

Abraham Gronovius (1694–1775), son of the preceding, was librarian of Leyden Univ.

Johann Friedrich Gronovius (1690–1760), brother of the preceding, was a botanist and writer of *Flora Virginica* (1739–43) and *Flora Orientalis*, (1755).

Lorenz Theodor Gronovius (1730–77), son of the preceding, was the author of *Museum Ichthyologicum* (1751–56) and *Zoophylacium Gronovianum* (1763–81).

Groome, Francis Hindes (1851–1902), Eng. author, son of Archdeacon G., of Suffolk. By 1877 he had embarked on a literary career, and is especially known as a student of gipsies, their life, language, and customs. G. wrote *In Gypsy Tents* (1880); *Gypsy Folk-Tales* (1899); and ed. Borrow's *Lorenuero* (1900). He was one of the founders of the Gypsy Lore Society, and joint-editor of its Jour. from 1888 to 1891. Other works are *A Short Border History* (1887); *Two Suffolk Friends* (Archdeacon G. and E. Fitzgerald) (1895); and the novel *Kriegsspiel* (1890).

Groot, Huig van, see GROTIUS.

Groote Eylandt, is, lying off the N. coast of Australia in the gulf of Carpentaria. It is about 10 m. long and 40 m. broad.

Groote, Schuur, official residence of the prime minister of the Union of S. Africa. It is 3½ m. from Cape Town, near Rondebosch, and was formerly the home of Cecil Rhodes, to whom there is a memorial. It was originally, as its name tells, a 'big barn' owned by Jan van Riebeek and was restored for Rhodes by Herbert (later Sir Herbert) Baker.

Gropius, Walter (b. 1883), Ger. architect, b. in Berlin, son of Walter Adolf G., architect. Educated at Technical High School, Munich. Started work with Peter Behrens, Ger. architect. Practised privately in Berlin from 1910 to 1914 and from 1928 to 1931. Director of Grand Ducal Academy of Art, Weimar (1919) and of the Grand Ducal Saxon School of Affiliated Arts, Weimar, which he fused as the Staatliches Bauhaus or School of Architecture, with courses of art, science, and technology and which became celebrated for achievement in abstract art, functionalism in architecture, and experimentation in glass, metals, and textiles as materials (see further under ARCHITECTURE, Modern Architecture). In 1925 the school was transferred to Dessau to buildings designed by G. He resumed private practice in London, in partnership with Maxwell Fry, 1934–37. Prof. and chairman, School of Architecture, Harvard, U.S.A., from 1938. Practised in partnership with Marcel Breuer in Cambridge, Massachusetts, 1937–40. Adviser to new Bauhaus, Amer. School of Design, estab. in Chicago in 1937. Member of Amer. Institute of Architects since 1933. Publs.: *Staatsliches Bauhaus* (1923); *Internationale Architektur* (1925); *The New Architecture and the Bauhaus* (1935); and *The Bauhaus, 1919–28* (1938).

Gros, Antoine Jean, Baron (1771–1835), Fr. painter, b. in Paris, was the son of a miniature painter. He studied first at David's studio, and afterwards travelled in Italy, where he became acquainted with

Napoleon Bonaparte, having been introduced by Josephine. He was given an official position by Bonaparte and became a military painter. In 1824 he was made a baron by Charles X. for his paintings in the Pantheon. He afterwards gave up the romantic style of painting and turned to the classic style. In this, however, he seems to have been unsuccessful, and committed suicide by throwing himself into the Seine. His best pictures are 'Bonaparte at the Bridge of Arcole'; 'Napoleon Visiting the Plague-stricken at Jaffa'; 'The Battle of Eylau'; 'The Meeting of Charles V. and Francis I.'; and among his works in the classic style, 'Hercules and Diomedes.' See studies by G. Dargent, 1887, and H. Lemonnier, 1905.

Grosart, Alexander Balloch (1827–99), Scottish ecclesiastic and writer, b. at Stirling. He was a student at Edinburgh Univ., and in 1856 was appointed Presbyterian minister at Kinross. In 1865 he became minister of Prince's Park, Liverpool, and of Blackburn in 1868, giving up the ministry in 1892. His chief work was done in his editing of Elizabethan literature. He pub. the Fuller's Worthies Library, consisting of thirty-nine vols. (1868–76), and in the latter year began the Chertsey Worthies Library, both of which publs. included the works of many authors, among them George Herbert, Sir Philip Sidney, and Abraham Cowley. In addition to these he ed. the works of writers such as Edmund Spenser (1882–84); Samuel Daniel (1885–96); and a number of others. See O. Smeaton, *A Great Elizabethan*, 1899.

Grosbeak, name applied to some of the species of the family Fringillidae, belonging to the order Passeriformes, and including the various kinds of finches. In these birds the beak is stout and very much developed. Among the species may be mentioned the Pine G. (*Pyrhula enucleator*), found in the regions of the N., and the Hawfinch (*Coccothraustes vulgaris*), occasionally found in Britain.

Grose, Francis (c. 1731–91), Eng. antiquary, b. at Greenford in Middlesex. He was at first a draughtsman, and exhibited his architectural drawings at the Academy, and from 1755 to 1763 was Richmond herald. He spent a large part of his time in antiquarian research, and during this time became acquainted with Robert Burns. His chief works are *Antiquities of England and Wales* (1773–87); *Classical Dictionary of the Vulgar Tongue* (1785); and *Antiquities of Scotland* (1789–91).

Grosnay, or Grosny, see GROSNAY.

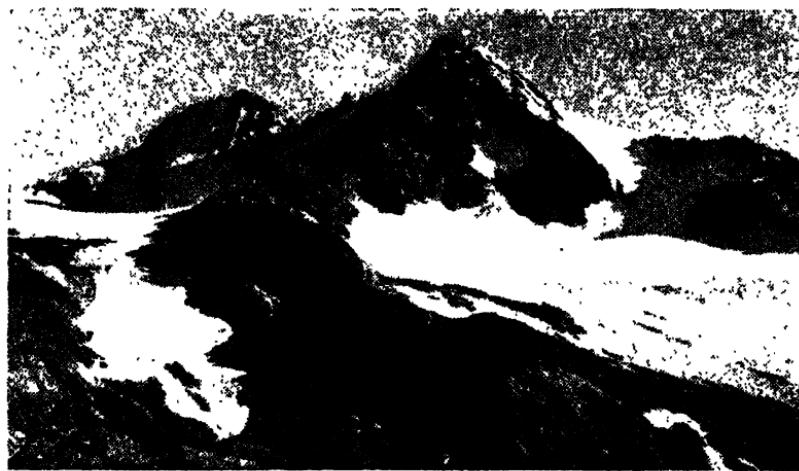
Grossenhain, tn. of Saxony, Germany, to the N.W. of Dresden, and on the R. Röder. It is noted for the manuf. of woolen goods, hosiery, and machinery. Pop. 14,600.

Grosseteste, Robert (c. 1175–1253), bishop of Lincoln, b. at Stradbroke in Suffolk of humble parentage. He was educated at Oxford and Paris. He became chancellor of Oxford Univ. and rector of the Franciscans in that tn. After holding the offices of archdeacon of Northampton and then of Leicester, he

became, in 1235, bishop of Lincoln. While holding this office he carried on a dispute from 1239 to 1245 with the Lincoln chapter, finally gaining his point—the right of visitation. He also stood up for the rights of the Church against the State, thus involving himself in disputes with Henry III., and for his own Church against that of Rome, thereby coming into conflict with the pope. See F. S. Stevenson, *Robert Grosseteste, Bishop of Lincoln*, 1899.

Grosseto: 1. It. prov. in Tuscany. It is a mining and agric. dist., but is very barren and unhealthy in parts. Area 1735 sq. m. Pop. 177,000. 2. Tu. of

Polytechnic as an entertainer, with comic songs and sketches at the piano. In 1877 he began a successful career as actor in *The Sorcerer*, later playing in many other Gilbert and Sullivan operas, and winning especial distinction as the admiral in *Pinafore*. He was with the D'Oyly Carte company at the Savoy from 1881 to 1889, and then resumed his individual recitals for a time. He played in *His Excellency* (1894); *Young Mrs. Yarde* (1898); and *The Gay Pretenders* (1900). Again resuming his recitals for some years, he finally retired in 1909. His writings include *The Reminiscences of a Society Clown* (1888); *The Diary of a Nobody*



Schildknecht, Graz

THE GROSSGLOCKNER FROM THE SOUTH

Italy, cap. of the above prov., about 40 m. S.S.W. of Siena. In the Second World War the cloisters of the cathedral were razed, but the main building was undamaged; the Chelliana Library was wrecked, but most of the valuable books had been removed to safety. Pop. 26,000.

Grossglockner, mt. of the Alps (12,460 ft.), the culminating peak of the Hohe Tauern on the borders of Carinthia, Salzburg, and the Tyrol, Austria. First ascended in 1800.

Grossglogau.

Grossgörschen, vil. of Saxony, Germany, situated S. of Lützen. The battle of Lützen, in 1813, is often styled the battle of G.

Grossi, Lodovico, see VIADANA.

Gross-Lichterfelde, tn. and com. of Germany in the prov. of Brandenburg. It forms a suburb of Berlin, and is situated about 6 m. from the city. Pop. 48,000.

Grossmith, George (1847-1912), Eng. actor and public entertainer, son of a journalist. In 1866 he was a reporter for *The Times*, but soon gave it up for the stage. In 1870 he made his début at the

(with his brother, Weedon G., 1894); *Cups and Saucers*; and various songs.

Gross-Moyeuvre, see MOYEUVRE-GRANDE.

Grosswardein, see ORADEA MARÉ.

Grosz, George (b. 1893), Ger. painter of the ultra modern school, who, recognising in the political development of Hitlerite Germany an imminent threat to his life, emigrated to the U.S.A. in 1932, and was subsequently naturalised. To-day he is considered one of the leading Amer. painters. In Germany his Hogarthian art, with ruthless and acid cynicism, satirised militarism, capitalism, the bourgeoisie, and the reactionary powers represented by the generals, the big industrialists, the E. Prussian Junkers, and the Church. Became leader in the school of Ger. expressionism known as the 'new objectivity.' From 1933 he and his work disappeared into oblivion so far as the majority of Ger. were concerned and his paintings were among those condemned in Hitler's exhibition 'Degenerate Art.' His 'Ecce Homo'—Christ on the Cross wearing a gas-mask and army boots—

brought him in the late twenties, and long before Hitler, to face a tribunal on a charge of blasphemy. Works belonging to the Amer. phase of his art include 'Even Mud has an End,' a work symbolic of tortured mankind. In 'Glory's Last Ride' the apocalyptic rider, War, has not been more impressively delineated since Dürer. Apart from these drawings, which belong to his most mature works, his output in America includes landscapes, still-lifes, portraits, studies of animals and plants, all painted with love for his models and with masterly skill. He has a studio near New York. See study by M. Ray, 1927, and I. Hofbauer (ed.), *George Grosz, 1919*.

Grote, George (1794–1871), eminent Eng. historian and politician, author of a standard work on Greece. He was educated at Charterhouse School, and after spending thirty years of his life as a banker and ten as one of the members of Parliament for London, he retired from Parliament in 1831 and from business in 1843 to give his whole time to literature. He was, with Bentham and Mill, one of the group of 'philosophical' radicals whose principles he actively supported in Parliament; he was one of the chief advocates of the ballot. G. criticised Mitford's *History of Greece*, attacking its anti-democratic deductions, which he held to be based on mis-conception. His own *magnum opus* regards the gov. of Athens as that of an idealised democracy. G.'s *History of Greece*, characterised by deep learning and the method of the 'philosophical' historian, superseded Mitford's and even the more scholarly work of Thirlwall. He wrote also *Plato and other Companions of Socrates*, and an unfinished work on Aristotle. See life by Mrs. G., 1873.

Grotendorst, Georg Friedrich (1775–1853), Ger. orientalist and classical philologist, educated at Göttingen. Was director of the Lyceum at Hanover. G. is most famous for contributing to the decipherments of old Persian (cuneiform) inscriptions. His *Neue Beiträge zur Erläuterung der persisch-palästinischen Keilschrift* appeared in 1837; *Neue Beiträge zur Erläuterung der babylonischen Keilschrift* (1840). Other works are *Anfangsgründe der deutschen Poesie* (1815); *Rudimenta linguae Umbrae* (1835–38); *Rudimenta linguae Oescar* (1839); *Geographie und Geschichte von Altitica* (1840–42). He also revised C. Wenck's *lateinische Grammatik* (1823–1824) and contributed to the *Encyclopædia* of J. Ersch and J. Gruber (1818). See works of A. H. Sayce on *Ancient Monuments* (1881–94).

Grotesque (It. *grotesco*, from *grotesca*, style of painting found in ant. crypts, *crypta*, or *rotta*), in art a capricious and incongruous style of decoration, in which human figures, animals, flowers, and fruit are all fantastically mingled in wild confusion. This style was used in the thirteenth century, and rediscovered during excavations made in the bathes of Titus. It was very popular in the Renaissance period, but soon became debased. G. has come to be applied to any fanciful combination of ideas, or to any

extravagant and absurd representation or appearance. See also ARABESQUE; CARICATURE. See Florio's *Dictionary*, 1598 and 1611.

Groth, Klaus Johann (1819–99), Ger. poet, b. at Heide in Schleswig-Holstein and educated at Tondern. He wrote lyric and epic poetry, and although his poems do not reflect the expression of Ger. country life as well as those on his own on whom he modelled his own, nevertheless he has gained for himself a place among the Ger. poets. His chief works are *Quickborn* (1852); *Drei Platt-deutsche Erzählungen*; *Vierlein* (1855); and *Volksleben in plattdeutschen Gedichten* (1857). See lives by G. Seelig, 1924, and H. Schneider, 1930.



HUGO GROTIUS

Engraving after a picture by M. J. Vrevelt.

Grotius, Hugo, otherwise known as *Hug van Groot* (1583–1645), celebrated Dutch jurist, b. at Delft and educated at Leyden. Leaving here he entered the diplomatic service and was for a short time in service with an embassy to England. He became pensionary of Rotterdam and supported the Arminians in their religious controversies. This gained for him the hatred of Prince Maurice, and he was arrested and condemned to imprisonment for life. By the aid of his wife he escaped and took refuge in Paris. Here he was granted a pension by Louis XIII. (1621). He distinguished himself in every branch of literature and diplomacy. In 1625 he issued his celebrated work on international law, *De Jure Belli et Pacis*. He became the ambas. of Sweden at the Fr. courts, and later proceeded to Stockholm. Returning from here he died at Rostock. He wrote much on theology, hist., and law, whilst as a poet he pub. some good verse both in Lat. and Dutch. His tragedy, *Adamus Rex*, was one of Milton's sources. He annotated the

Bible, 1641-46. Other works: *De Veritate Religionis Christianae* (1627) and *Annales de Rebus Belgicis*, his best historical work (1657). See life by G. Butler, 1827; and studies by A. Hély, 1875; D. de Bruyn, 1894; and Vreeland (Eng. 1918). See also J. Ter Meulen, *Concise Bibliography of Hugo Grotius* (Leyden), 1925, and J. Hulzinga, *Weg der Kulturgeschichte*, 1930.

Groton, tn. in the U.S.A., co. of New London, Connecticut, on the R. Thames. Its chief industries are connected with engineering and tobacco. In 1781 the tn. played an important part in the Amer. War of Independence, but the garrison was massacred. Pop. 4700.

Grotta del Cane ('Grotto of the Dog'), cave near Naples and bordering on Lake Agnano. The cave is filled with carbonic acid gas fumes of great strength. The name was given because little dogs when sent into the cave were almost suffocated, but revived on being taken out.

Grotte, Sicilian tn., 13 m. N.E. of the tn. of Girgenti. It is the centre of the sulphur mining industry. Pop. about 11,000.

Grotzisk (Ger. Gratz), tn. of Poland in the prov. of Poznan.

Grouchy, Emmanuel, Marquis de (1766-1847), Fr. general who was b. in Paris. He first saw active service with the revolutionary armies in La Vendée. He was second in command of the army which was sent to invade Ireland, and was able to land in Ireland, although he accomplished little. He next proceeded to Italy, where he helped Jonibert. He showed great courage and ability during the battles of Eylau, Friedland, and Wagram, and was in command of the bodyguard of Napoleon during the Russian campaign. He fought at Leipzig, and covered the retreat of Napoleon to Paris. He was among the first to welcome Napoleon on his return to France. He fought and defeated Blücher at Ligny, but misjudged that general's tenacity of purpose. After attempting to hold together the Fr. armies after Napoleon's second abdication, he fled to the U.S.A. He returned in 1819, and was restored to his rank in the Fr. army in 1831. His memoirs (5 vols.) were pub. by his grandson.

Ground Annual, in Scottish law an interest in land in the nature of an ann. rent or perpetual annuity. It is of two kinds: (a) Feu duties arising out of church property parcelled out in lordships erected by the crown, such feu duties being the interest retained by the lords of erection after resigning their superiorities to the crown. The feu duties became perpetually payable because the crown never rendered any consideration (q.v.) for the power to redeem them. (b) Rents reserved for building lots in burghs where sub-feus are prohibited. Such G. A. is in the nature of a real burden laid on the lands of a fixed ann. payment in lieu of price, and is usually accompanied with a personal obligation on the part of the building speculator that he and his representatives in a sale will not get rid of the G. A.

Ground-base, in music, a bass, consisting of a few notes or bars, unceasingly

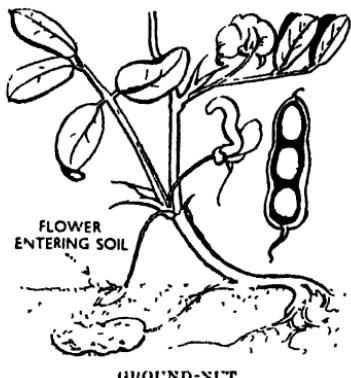
repeated, and each time accompanied by a new or varied melody. See Beethoven's *Sonate pathétique*, Opus 13, first movement, *moto allegro*.

Ground-ice, see ANCHOR-ICE.

Groundling (*Cobitis tania*), fish of the loach variety. It is rarely found nowadays, but occurs in Eng. waters occasionally. It is very small.

Ground-nut, **Earth-nut**, or **Pea-nut**, leguminous vegetable which can be grown as an ann. crop on light soils in almost any tropical or sub-tropical country. So far as the Brit. Colonial Empire is concerned production is centred chiefly in E. and W. Africa, but small quantities are also grown in Malaya, Mauritius, Hong Kong, and St. Vincent. As well as being used as an oil-seed it is used as a foodstuff not only as a staple in the countries of production but also as a dessert nut in European and Amer. countries under the name of pea-nut or monkey-nut. In Kenya, Uganda, and Tanganyika Gs. are one of the subsidiary native food crops. In W. Africa the G. is one of the most important products both for local consumption and for export. In Nigeria the production is centred in the extreme N. of the protectorate. Before the Second World War exports had risen to as much as a third of a million tons valued at over £1,000,000. They are the second most valuable Nigerian export. In the Gambie Gs. are an important native foodstuff and almost the only export crop, exports in 1937 being of the order of 70,000 tons. In the Gold Coast and Sierra Leone Gs. are a native foodstuff of secondary importance and exports are negligible. Only a few hundred ac. are under Gs. in Hong Kong, the Malay States, and Mauritius, cultivation in these dependencies being solely for local consumption. The G. is exported in two forms, 'undecorticated,' i.e. in the shell, and 'decorticated.' The shell, which represents about a quarter by weight of the nut, is commercially of negligible value. The oil extracted from undecorticated nuts is used mainly in the manuf. of edible commodities, such as margarine and salad and frying oils, while the oil from decorticated nuts is used in soap-making as well as for edible purposes. No available statistics of production as opposed to export are available for most African countries or China, in both of which areas Gs. are grown extensively for local consumption. One reliable estimate of world production in 1939, disregarding production for internal consumption in Brit. W. Africa and China, is about 4,776,000 tons, of which 3,414,000 tons would be available for export. Of the quantities which enter into world trade nearly three-quarters are produced in India. Of the whole Indian crop less than a quarter is normally exported in the raw form, but there are also Indian exports of G. oil, and if the equivalent in raw material of this oil is taken into account about one-third of the whole Indian crop can be regarded as grown for export. The oil content of the G. varies in different varieties. In some it is as high as 48 per cent, but not the whole of

this can be extracted, and allowing for this fact, for the lower proportion of oil in certain varieties and for the fact that the oil content has to be reduced by a quarter in the case of undecorticated nuts, an average figure of 36 per cent may be used for calculating the oil content of G.s. On this basis the oil equivalent of 3,414,000 tons of nuts is 1,229,000, to which must be added 40,000 tons which is produced in those countries which have facilities for extracting oil.



Tanganyika Ground-nuts Scheme.— This scheme was launched early in 1947 in the hope of securing a harvest which would give Britain ample supplies of margarine, oils, and fats, at a time when there would continue to be a world shortage in these commodities. The White Paper on the scheme envisaged a minimum of 600,000 tons of oil-seeds, rising to an aim production of 800,000 tons by 1950–51. With this target in view the gov. decided to spend £25,000,000 on the clearing of 3,500,000 ac. in the Kongwa, Urambo, and S. areas of Tanganyika in the course of six years. But up to the spring of 1949, with a third of the allotted time gone, £20,000,000 had been expended, while not more than 75,000 ac. had been put into cultivation. Of these over 25,000 ac. had been cleared but not rooted, and over 20,000 were open land which did not need much clearing. The fruit of two years' endeavour, in fact, amounted to less than 30,000 ac. The average yield of the 1948 harvest, originally estimated at 750 lb. of G.s. per acre proved to be less than 500 lb. The gov. then decided that the scale of the scheme should be cut down without, it was claimed, any loss in the yield of oils and fats. In the light of experience the corporation formed to operate the scheme now believed that they could produce 600,000 tons of oil-seeds from some 2,000,000 ac. At Kongwa just over 50,000 ac. were (1949) under cultivation—25,000 were G.s., 20,000 sunflower, and 2,000 maize and other experimental crops. At Urambo, where the scheme was at an earlier stage,

500 ac. were (March 1949) under G.s. and 2700 under sunflower. The minister of food, who was responsible for the scheme, maintained in his reply in the House of Commons to critics of the scheme (March 13, 1949) that the necessary tonnage could be obtained from the reduced area by altering the rotation of crops so as to grow sun-flowers instead of grass during part of the time that the soil was being rested. Development of the Kongwa area, which was started first, might have to be restricted and more effort put into the W. area of Urambo, and into the S. area, which was likely in the end to be the largest of all. The principle was accepted that in developing the S. area ports, railways, and housing must be completed before ambitious agric. expansion were attempted. Both the time and the cost of the scheme were therefore likely to be double the estimates made in the original White Paper, but it was suggested by the gov. in 1949, with some optimism perhaps, that the course of world economic conditions, and of prices, might double the earnings in the same way as they had doubled the difficulties. There could be only one reason for abandoning the scheme now that the country was so deeply committed, and that would be proof that it were agriculturally impracticable. The best opinion, after bitter trial and error, was against so pessimistic a conclusion, although admitting that faulty methods of cultivation could still lead to grievous consequences. See *An Economic Survey of the Colonial Empire*, H.M.S.O., 1940. See also W. K. Hancock, *Survey of British Commonwealth Affairs*, vol. ii., part ii., 1942, and Richenda Scott and Darryl Ford, *The Native Economics of Algeria*, 1916.

Ground Pigeon, pigeon of the Peristerine family. It has longer legs than the usual type of pigeon. Turtledoves belong to this family.

Ground Rent, rent reserved by a landowner to himself in consideration of allowing buildings to be erected on his land. The customary arrangement in speculative building operations is for the landowner not to grant a lease at all until the buildings or part of the buildings are completed, but to enter into an agreement with the builder to reserve a total G. R. on his land to be subsequently apportioned to the houses as and when they are completed. As each house or integral building is completed the landowner grants a lease in which he reserves the G. R. on the site covered by such house or building. The interest of the builder in the land therefore ends with the sale of the houses built, unless, as often happens, he buys the G. R. himself. As the builder thus drops out of the transaction, the liability on the covenants becomes severable, each purchaser being liable only for breaches in respect of his own lease and house.

Groundsel (*Senecio vulgaris*), herb of the Composite order. It ranks as a weed and bears yellow flowers. Sometimes given to cage birds, especially canaries, which like the leaves. But it should not

be given; it contains a poison which is cumulative in its effects on the liver.

Group Captain, rank of an officer commanding a number of squadrons in the R.A.F., equivalent to that of an army colonel or naval captain.

Groups. Theory of, study in higher mathematics which deals, not with actual quantities, but with operations. Certain operations in elementary work are familiar, e.g. multiplication, the squaring of a number, the rotating of a figure about an axis, and differentiation. If A is any operator which operates on any quantity F, the result is usually expressed AF. If A operates again on the result, this becomes A^2F or A^3F ; if again, A^4F , and so on. When the result of two successive operations in any order leaves the subject of the operations unchanged, the operators are then said to be *inverse*. The successive application of an operator and its inverse is known as the *identical* operation. Thus if X and Y are two such inverse operators, $XYF = F$ and $YXF = F$; i.e. $XY = 1$ and $YX = 1$, and hence it is found convenient to write X^{-1} for Y. Thus $XX^{-1} = 1$ and $X^{-1}X = 1$. Thus the result of the inverse operation of X on F is $X^{-1}F$, and the result of a second operation is $X^{-2}F$, and so on. Let A, B, C be three operations capable of operating on the same set of objects, of which the result of any two in any order equals the third, e.g. AB = C, then A, B, C and their inverses are said to form a group. And generally any number of such operations, of which the result of the successive application of any two is equivalent to a third form with their inverses a group. The number of operations in a group may be finite or infinite. When it is finite the number is called the order of the group. For example, $A^3, A, 1, A^{-1}, A^{-2}$ form a group, which in this case is said to be cyclical.

Grouse and Grouse-shooting. G. is a name which is in the exact sense applicable to all the members of the sub-family Tetraoninae; as commonly used the word refers only to the Red G. In addition to this species the Black G. (*Tetrao tetrix*) and the Wood G. (*T. urogallus*) are found in Great Britain; these are better known by the names respectively of Blackcock and Capercaillie, and reference should be made to articles under those headings. Among the other species of G. may be named the Pinnated G. (*T. cupido*), peculiar to America; the Dusky G. (*T. obscurus*), which inhabits the Rocky Mts.; the Canadian G. (*T. Canadensis*), found in Canada and the U.S.A.; the Hazel G. (*Bonasa sylvestris*) of N. Europe; and the Ruffed G. (*B. umbellus*) of N. America. The Sand G. (*Pterocles*) and the Prairie Hen (*Syrrhaptes*), which are found in the Asiatic table-lands, constitute another family (the Læroclidae). For the White G. (*Lagopus mutus*, or *vulgaris*) see under PTARMIGAN. The Red G. (*L. Scoticus*), also called the Moorcock or Moor-fowl, is considered to be a variety of the Willow G. (*L. albus*), which is found in N. Europe, Asia, and America. It is found in the N. of England, particularly in Yorkshire,

Lancashire, Derbyshire, and Durham, in Wales, Ireland, and the Scottish Is., and in most abundance in the Highlands of Scotland. The species is peculiar to the above-mentioned localities, and differs from the other members of the same genus in the fact that it does not turn white in the winter. G.-shooting, as generally used, refers exclusively to the Red G., and under that heading the habits, etc., of the bird will be treated.

Grouse-shooting.—The Red G. is monogamous; the pairing takes place early in the spring. The female lays from five to fifteen eggs, which require twenty-four days to hatch. The young birds are strong and hardy after the first fortnight, which is a somewhat critical period. The main enemy of the birds is the G. disease (*Strongylus pergracilis*), an epidemic disease which occasionally causes great ravages among the birds, and in a very bad season will practically preclude shooting over the moors affected. All through the summer the young birds follow the parent birds; in the autumn they 'break up' until the winter, when they come together again in flocks (known as 'packs'), numbering, on the average, about thirty or forty, though sometimes as many as sixty are found. In order that a G. moor should furnish an abundance of birds, the latter must have a good supply of food and drink. The first requisite for a moor is therefore an abundant supply of pure water, and as the young shoots of the heather and wild ling form the chief food of the birds at certain seasons, the heather must be made to produce such shoots. This is effected by skilful periodical burning of the heather in tracts, as old heather will not provide the required shoots. There are two methods of shooting G., over dogs or by driving. The former method, usually only practised on small moors, is impossible after the birds have begun to pack. The most important thing in G.-shooting over dogs is the direction of the wind. When a G. is disturbed it will fly down the wind, and if the sportsman is also coming down the wind, his chance of a good shot will be small. If the G. is made to breast the wind as it rises, it will turn and fly down the wind as soon as it has a sufficient velocity, and as it turns there will be the best chance of a shot. A moderate breeze blowing across the line taken by the shooting party is the best, and the most favourable weather is clear and sunny. If the weather is wild and wet, the best of dogs and shots do not stand much chance of a heavy bag. The dogs used are pointers or setters, the former being better if there is a plentiful supply of birds, otherwise the latter. The G. are driven towards hidden butts or batteries, in which are the guns and which are situated about 80 yds. apart. It is obvious that upon the site of the butts depends much on the success of the shooting. The beaters are spread out in the form of a crescent, and are provided with flags to show the line of flight. The flanks must be well protected, the usual line of flight of the birds and the peculiarities

of the dist. must all be taken into account. The birds are shot as they fly towards the butts; their flight is so very rapid that it requires a first-class shot to kill with both barrels. From Dec. 11 to Aug. 11 (inclusive) is the 'close time' for G.; 'the Twelfth' is the abbreviation by which the opening of the season is generally known. For G. diseases see the papers of Prof. Young in the *Proceedings of the Natural History Society of Glasgow* (T.P. 225), and Dr. Kain's work on the subject. See *Grouse Shooting*, 1893; T. Cank, *Forty Years Mingled in Game, Fur, and Feather*, 1891; and M. Stephens, *Grouse Shooting*, 1939.

Grove, Sir George (1820–1900), Eng. writer, b. at Clapham, London, who is principally remembered for his contributions to the literature of music. He was at first an engineer, and spent his early days in the W. Indies. In 1849 he became secretary to the Society of Arts and later to the Crystal Palace. Here he was largely responsible for the institution of those concerts which have done so much to promote the education of the Brit. public in music. In 1863 he became editor of *Macmillan's Magazine*, and between the years 1869 and 1889 he ed. the *Dictionary of Music*. He was the first director of the Royal College of Music, and was knighted on his appointment. See F. G. Edwards, *A Biographical Sketch of Sir George Grove*, 1897; and C. L. Graves, *The Life and Letters of Sir George Grove*, C.B., 1903.

Grove, Sir William Robert (1811–96), Brit. scientist and lawyer, b. at Swansea; he was educated by private tutors and at Brasenose College, Oxford. He was called to the Bar in 1835, and then for a time devoted himself to scientific studies. He invented a voltaic cell that is called the G.'s cell, and by this, and by an anticipation of the methods of electric lighting, he made a great name for himself in the realm of science. He pub. in 1816 a book called the *Correlation of Physical Forces*. In 1866 he was president of the Brit. Association. His legal work had not been neglected, and in 1853 he became a Q.C., and was later made a judge of the court of common pleas.

Grove's Cell, see CELL, VOLTAIC.

Grovier, fish found chiefly in the fresh waters of N. America. It usually measures 2 ft. or more, and is allied to the perch family (*Percidae*). This fish is edible.

Growth always denotes increase. Applied to mental processes it means increase in ability to think and to reason, and in knowledge. Applied to nations or ideas, G. denotes progress or development. The term may also signify the result of the process of G., e.g. in describing cancer as a malignant G. Generally G. is increase in material, but this increase is acquired in very different ways by living and inanimate things. The G. of inanimate substances, such as crystals, proceeds by the addition of similar chemical material to the exterior, whereas living organisms grow by taking food within them, using it for the synthesis of various compounds, or breaking it down for the liberation of

energy. Organic G. has been defined in various ways—as increase in volume, as a change of form, and as increase in bulk; but it is now generally accepted as an increase in the material constituting an organism. This increment may be accompanied by change in volume, but the two are not necessarily concomitant. The increase in material of an organism is equal to the difference between the amount of food synthesised and that broken down, that is, to the difference between anabolism and catabolism. If the result be positive, what is generally understood by G. has taken place; if the result be negative, a decrease in material or reduction will be indicated, and some of the lower animals, such as Planarians, can be induced by starvation to diminish to about one-tenth of their normal size. When they are fed positive G. again takes place. Several scientists regard G. as an autocatalytic reaction, in which the rate of change is increased by one or more of the products of the reaction acting as catalysts. Other investigators consider that although certain reactions concerned with G. are autocatalytic, other complex factors also enter into the process, and consequently the autocatalytic theory is only partial and not applicable to G. as a whole.

See S. Minot, *The Problem of Age, Growth, and Death*, 1908; C. M. Child, *Senescence and Rejuvenescence*, 1915; W. D'Arcy Thompson, *On Growth and Form*, 1917; T. B. Robertson, *The Chemical Basis of Growth and Senescence*, 1923; J. L. Smith, *Growth*, 1932; and M. B. McGraw, *Growth*, 1935.

Groynes, see under COAST PROTECTION.

Groynes, The, see CORUÑA, LA.

Grozny (Grosnaya, Groznyi), tn. of modern growth on an affluent of the R. Terk in the G. region (Daghestan) of the R.S.F.S.R., in the N. Caucasus. It has refineries of petroleum. A pipe line connects G. with the Caspian Sea. Russia draws 14 per cent of her oil from G.'s oil-field. The region is rich in gold, silver, lead, iron ore, etc. In the Second World War the Ger. invaders in 1942 made desperate efforts to capture the oilfield of G. By Aug. they had overrun the Maikop field and thereby jeopardised the more important field of G. By Aug. 24 they were within 85 m. of G. and by the 26th they had reached the Mozdok region on the very edge of the G. oilfield. But the Russian defences held firm and the Ger. were eventually driven back. See further under EASTERN FRONT IN SECOND WORLD WAR. Pop. 172,400.

Grub, George (1812–92), b. in Old Aberdeen and educated at the univ. there, where he ultimately became prof. of civil law. His great work was *The Ecclesiastical History of Scotland* (1861), which was written from the Anglican point of view. See life by Walk. r., *Three Churchmen*, 1893.

Grub, term applied to the larvae of coleopterous insects. It is also erroneously given to the maggots or larvae of Diptera, which differ from the true Gs. in having no distinct head, and to the caterpillars or larvae of Lepidoptera, which

differ having rudimentary legs. The G. of a bee or beetle generally has a distinct head but no legs. The so-called sheep-grub is the larva of the gad-fly, which sometimes deposits its eggs in the nostrils of animals.

Grubenhagen, old principality of Germany. It was in the prov. of Hildesheim and formed part of the kingdom of Hanover, being divided into two dists.—the E. and W.—having the Harz Mts. as a dividing line. The chief tn. was Elmbeck, situated on the Ilm. Pop. about 80,000.

Gruber, Johann Gottfried (1774–1851), a Ger. author and historian, was b. at Naumburg. At Weimar he enjoyed for a time the friendship of Goethe. He became a prof. at the univ. of Wittenberg. With Prof. Ersch he ed. the *Allgemeine Encyklopädie der Wissenschaften und Künste* (1818), a work which he continued after Ersch's death. He also wrote *Geschichte des menschlichen Geschlechts* (1805), and works on Herder, Wieland, and Klopstock; and ed. the *Allgemeine Literaturzeitung*.

Grub Street, now called Milton Street in honour of the poet whose home was near it, was famous in the seventeenth century for the reason given in Dr. Johnson's interesting definition in his *Dictionary*: ‘Originally the name of a street near Moorfields in London, much inhabited by writers of small histories, dictionaries, and temporary poems, whence any mean production is called *Grub Street*.’ The name has also been applied, since this time, as a collective term to struggling hack writers.

Grudziadz, see GRAUDENZ.

Grun, Anastasius, see AUERSBERG, COUNT OF.

Grun, Hans, see BALDUNG, HANS.

Grunberg (Polish Zielona Gora), tn of Poland in Lower Silesia, 33 m. from Glogau. It is noted for manuf's of woolens, machinery, and straw hats, and the vine was cultivated to a large extent, and wine and champagne exported. It was here in the Second World War that the two Russian marshals, Konev and Zhukov, linked forces on Feb. 16, 1945, in the final drive to Berlin. Pop. 25,300.

Grundtvig, Nicolai Frederik Severin (1783–1872), Dan. antiquarian, poet, preacher, and reformer, b. at I'dby, Zealand, and educated at Copenhagen. He was pastor of Frøslev from 1821 to 1822, when he became chaplain of the Church of the Saviour, Copenhagen. In 1825 he made a vehement protest in his *Kirkens Øjenmaale* against ‘rationalism’ in the church. This raised a storm of bitter controversy, and G. was deprived of eccl. office. He championed the cause of civil and religious freedom, advocated the separation of church and state, and helped to bring about many reforms. As a member of the *Folkssting* he collaborated in the drawing up of the Liberal constitution of 1849. He was reinstated and made a bishop in 1861. G. studied and wrote upon the antq. Norse traditions and trans. the *Saxo Grammaticus*, and *Snorri Sturluson* (1818–22) and the *Beowulf*. He pub. a vol. of the antq. popular songs of

Iceland, *Popular Danish Songs*, collected among the Dan. peasantry who sang them to him, *Kort Begreb af Verdens Kronike i Sammenhæng*, sev. vols. of poems, and a system of philosophy, *Mind and Liberty*. See lives by J. Kultan, 1877; M. Holmstrom, 1917; and E. Lehmann, 1929.



Royal Danish Embassy

GRUNDTVIG CHURCH, COPENHAGEN

Grundtvig, Svend Hersleb (1821–33), son of the preceding, a Dan. philologist. His greatest work is *Danmarks gamle Folkeviser* (1853–83), in which are reproduced the antq. texts of popular songs, together with their subsequent forms collected orally.

Grundy, Mrs., the name given to an imaginary character, who may well be described as the presiding deity of Eng. respectability. She appears first in Eng. literature in a play called *Speed the Plough*, where she is continually referred to as an authority on the proprieties. Her name has become a household word, but is used now with a contemptuous connotation.

Grundy, Sydney (1818–1914), Eng. dramatic author, b. at Manchester. He practised as a barrister for a few years, but became known as a successful playwright. His first play, *A Little Change*, was produced at the Haymarket Theatre in 1872, and in 1887 he made a great success with *The Bells of Haslemere*, written with H. Pettitt. His other comedies include *A White Lie* (1889); *A Fool's Paradise* (1889); *Sowing the Wind* (1893); *An Old Jew* (1894); and *A Bunch of Violets* (1894, taken from Feuillet's *Montjoie*). The most successful of his adaptations was *A Pair of Spectacles* (1890), taken from

Les Petits Oiseaux de Labiche and Delacour). Others were *A Marriage of Convenience* (1897); *Business is Business* (1905, from Mirbeau); and *The Diplomats* (1905).

Gruner, Wilhelm Heinrich Ludwig (1801-82), Ger. engraver, b. at Dresden. He became the director of the Royal Museum at Dresden, and made a great name for himself as an engraver of many fine lit. masterpieces. In 1850 he pub. *Specimens of Ornamental Art* and *The Terra-cotta Architecture of North Italy* (1867).

Grünewald, Matthias (1460 or c. 1475-80-1528), Ger. painter, b. at Würzburg. His real name was Matthias Neithardt, or Gotthardt. He is first mentioned in 1501 in the archives of Seligenstadt, near Aschaffenburg. From 1508 to 1514 he was court painter to the archbishop of Mainz, Uriel von Gemmingen, and after 1514 to the elector of Mainz, Albrecht von Brandenburg. He was active also as an engineer (fountains, etc.) and as an architect. In 1526 he was working in Frankfurt-on-Main, and in 1527 in Halle. His 'Christ mocked' (c. 1503), painted on a pine panel, is in the Alte Pinakothek, Munich. See studies by H. A. Schmid, 1911; W. Rolfs, 1924; F. Knapp, 1935; and M. Brion, 1939.

Grunting Ox, see YAK.

Grus ('the Crane'), S. constellation near Aquarius and Pisces Australis, introduced by sixteenth-century mariners. Near by are the constellations of Indus and Phoenix, on either side.

Grusenberg, Mikhail Markovitch, see BORODIN.

Grutli, or Rutli, meadowland of Switzerland, situated in the canton of Uri, near Lake Lucerne. The Swiss League was founded here against Austria by the peasant leaders, Stauffacher, Arnold, Melchtal, and Walter Furst. The meadow is now the property of the State, having been purchased by the schoolchildren of Switzerland. See J. C. F. von Schiller, *Wilhelm Tell*, II. 2.

Gruyère, dist. and tn. of Switzerland in the canton of Freiburg and 16 m. S.W. of that tn. It is noted for its cheese. The cap. of the dist. is Bulle. Pop. (tn.) 1500.

Gryfice (Ger. Greifenberg), tn. in prov. of Pomerze, Poland, situated just over 40 m. N.E. of Stettin; manufs. bricks, machines, and stoves. Pop. 9300.

Gryfino (Ger. Greifenhagen), tn. in the prov. of Pomerze, Poland, situated 12 m. S.S.W. of Stettin; great centre of the cattle trade. Pop. 8900.

Gryllidae, name of a family of Orthoptera, belonging to the section Saltatoria, and typified by *Gryllus*, the cricket genus. All members of this family are characterised by a cylindrical body, long, slender antennae, and, in the females, a long curved ovipositor. There are sov. genera, which are widely distributed, *G. domesticus*, the common house-cricket, being found in the old world and in N. America. The name grasshopper is often applied to *G. campestris* and *Nemobius sylvestris*, two species of field-crickets.

Gryllus, genus to which the crickets belong. This order is distributed all over the world, but there are only four Brit. varieties.

Gryphius, Sebastian (1493-1556), printer, b. at Reutlingen in Swabia. He settled at Lyons in 1528, and from that date onwards printed about 300 books, including Heh., Gk., Lat., It., and Fr. He was especially distinguished for the beauty of his Gk. and Ibleb. types, and his Fr. and Lat. books are still highly esteemed. Among the most noted of his works are the fine Lat. Bible of 1550 and Dolet's *Commentaria lingue Latinae*.



GUACHARO

Guacharo, or Oil-bird (*SSteatornis caripensis*), first found at Caripe in Venezuela. It constitutes the family Steatornithidae, but is allied to the Nightjars. It is about the size of a crow, and lives chiefly in caverns near the sea.

Guadagnini, name of a family of violin makers in Italy. Lorenzo, who between 1695 and 1724 resided at Milan, among other places, was a pupil of Stradivarius. His son, Giovanni Battista (1711-86), resided at Milan and Turin, both of them making instruments which are among the best of their kind.

Guadalajara: 1. Prov. of New Castile, Spain, bounded N. by Segovia, Soria, and Saragossa, E. by Teruel, S. by Cuenca, W. by Madrid. It is watered by trib. of the Tagus, and yields agric. produce. Silver is found in the dist., and pottery is manufactured. It was in this prov. that the It. mercenaries of Mussolini were heavily defeated by Sp. republican troops in the civil war (1936-39) (see under SPAIN, History). Area 4676 sq. m. Pop. 179,000. 2. Cap. of above on the Henares, 33 m. N.E. of Madrid. Among its chief buildings are the palace of the Mendozas and the Pantheon containing their tombs, the cloister of San Francisco, and a military engineering academy. There are textile and flour-mills, and some serge and flannel are manufactured. Pop. 12,000. 3. Cap. of Jalisco state, Mexico, 380 m. N.W. of Mexico city, with which it is connected by rail, and situated 5000 ft.

above sea level. Founded in 1530 by Sp. aristocrats, second largest city of the republic. Estab. originally as a base for exploration up the W. coast, it soon out-grew its rival, Santiago de Compostela, usurping its privilege as seat of the W. see. A few years after G. was first settled by conquistadores it was made the cap. of a rich and fertile region long known as the kingdom of New Galicia. The city prospered and by 1810 its pop. had reached 60,000. Many of its fine buildings were considerably damaged in an earthquake of 1818. During the following decades it suffered the desolation and stagnation of the War of Independence, but with peace prosperity returned. With the advent of the first Amer. locomotive (1888) the city's importance as a commercial and industrial centre was assured. Since then G. has steadily prospered, but it has never lost the charming old-world atmosphere of its Sp. colonial days which have left on it their indelible imprint. G. is a trade and rail centre and the terminal of the S. Pacific W. coast route. The city is large and handsomely laid out; the main plaza is a promenade in the centre of the city, flanked by the gov. palace and cathedral, and by adjacent arcades. Ant. orange-trees border the plaza which is planned as an old-fashioned garden. Elements of Sp., Moorish, and Hellenic architecture form a curious blend in the old gov. palace built in 1643 with loopholes and fortress-like windows. It was in this building that the patriot priest Hidalgo wrote part of his *Declaration of Independence*, 1811. G. is the seat of an archbishop. The cathedral is the most outstanding example of the transitional style in Mexico. Begun in 1618, a series of later reconstructions through three centuries has resulted in a building which includes Gothic, Tuscan, Arabic, Mudéjar, Corinthian, Byzantine, and Doric elements. It contains an 'Assumption' by Murillo. The little church of Santa Monica is noted for its elaborately decorated façade. Other notable churches are the Santuario de San José de Gracia, the church of Jesus María, San Felipe Sanctuary of our Lady Guadalupe, and the Mexicalzingo Church. The museum and library are housed in an ant. seminary, which building, constructed in 1700, is one of the finest examples of eighteenth-century architecture on the Amer. continent. It contains a remarkable collection of outstanding Sp. and Mexican paintings. The Degollado Theatre is a graceful building in the neo-classic style. Facing it is the temple of San Agustín, typical of the city's older architecture. The univ. of G., one of Mexico's chief centres of intellectual activity, is noted for its murals by Orozco. There are manufis. of cotton, woollens, pottery, metal wares, glass, and confectionery. Pop. 206,800.

Guadalaviar, riv. of E. Spain, which rises in a small lake in the Sierra of Baracán. Its course, amidst beautiful scenery, is generally S. and S.E. for 180 m. until it reaches the Mediterranean Sea at Valencia.

Guadalcanal, one of the largest and most

important of the is. of the Brit. Solomon Is. Protectorate; lies just N. of lat. 10° S. and is crossed by long. 160° E. It is 100 m. long by 34 broad. It is mountainous for the most part and has a grand system of peaks rising to 8000 ft. The high land at the S., where the big hills occur, is 'the home of mystery' (Ivens). In these hills, tradition says, there are wild men or ogres, the Muumuu, with long hair and stumps for feet. G. has dense forests, but extensive areas are devoid of trees, being clothed with a tall green mantle of grass, growing to a height of 6 ft. This grass extends over the plains and up into the mts., but the watercourses are lined with scrub and timber. Many streams of G. consist, in ordinary weather, of dry beds of stone and sand, water appearing only at a rock outcrop in the bed. A brilliant yellow orchid (*Dendrobium*) grows freely on the is. G. contains evidence of having been uprooted more than once and it would seem from the raised beaches, common round the coast, that the upheaval is still going on (Knibbs). The natives are Papuans of a dark colour and are superstitious. The practice of *tele* or *hele* (= 'ghost,' 'incarnation') seems to be connected with the cult of ginger as a thing possessing magical powers. The gov. has endeavoured, but with indifferent success, to put an end to the superstition of *tele*, which is really a sort of witchcraft. Rattan-woven shields, ornately decorated, were once a feature of local craftsmanship. The shin-bone spear, generally 11 ft. long or more, was a formidable weapon, the spear-head being carved from a human tibia; but they are very rare indeed to-day, and none has been made for many years. The prin. tns. are Aola and Lunga, both on the N. coast. G. was discovered in 1568 by Alvaro de Mendana, and was named by the Spaniard. Mendana intended to settle on it in 1585 but on that occasion he could not locate it. G. was the scene of a protracted campaign against the Jap. who landed powerful forces there in the summer of 1942. Amer. and Australian forces were landed soon afterwards. The Jap. were driven out by early 1943, having lost nearly 9000 men in killed or captured in the land fighting and many more in the sinking of ships, besides a large number of aircraft. See W. G. Ivens, *Melanésians of the South-East Solomon Islands*, 1927, and S. G. C. Knibbs, *The Savage Solomons*, 1929.

Guadaleazar, tn. of Mexico in the state of San Luis Potosí and 40 m. N.E. of that place. There are noted mines of quicksilver in the vicinity. Pop. 12,500.

Guadalquivir (anc. Baetis), riv. of Spain. It rises in the Sierra del Pozo Morena, and at first flows N.E. and then alters its course, assuming a S.-westerly direction through Andalusia, entering the Atlantic about 20 m. N. of Cadiz. It is navigable as far as Seville, below which it divides, forming the is. of Isla Mayor and Isla Menor. It is about 350 m. long.

Guadalupe: 1. Riv. of Texas, rising in Kerr co., and flowing into the bay of San Antonio. It is about 250 m. long. 2. Com. of Mexico, in the state of Zacatecas,

and situated 10 m. S.E. of the tn. of Zacatecas, with which it is connected by rail. Pop. about 8800. 3. Tn. of Uruguay, see CANELONES.

Guadalupe Hidalgo, tn. of Mexico, situated between 2 and 3 m. N. of Mexico. It is the site of a church which is much visited by pilgrims, and it was in this tn. that the treaty was made between the U.S.A. and Mexico in 1848, giving New Mexico and Upper California to the U.S.A. Pop. 5500.

Guadarrama, Sierra de, range of mts. in Spain, separating Madrid and Segovia, and situated between the Douro and the Tagus. The highest points in the range rise to about 8700 ft. Among them may be mentioned Sierra de Ayllon and the Pico de la Encina.

Guadeloupe, is. of the W. Indies and a Fr. colonial dependency. It is really formed of two is., Basse-terre and Grande-terre, separated by the Rivière Salée. Basse-terre is of volcanic formation, the largest volcano being Soufrière (a common name in W. Indian is. connoting any sulphurous mt.), while Grande-terre is comparatively flat. The climate is hot and the soil fertile, producing sugar-
the prin. crop - cereals *cuz*, coffee, cassava, yams, vanilla, cotton, and potatoes; while Basse-terre is covered with large forests. The dependencies of G. are Marie Galante (q.v.), St. Barthélemy (q.v.), Dégradé (q.v.), Les Saintes (see SAINTS, BATTLE OF), and part of St. Martin (q.v.), all of coral formation. The is. is ruled by a governor, assisted by a privy council, and is represented in the Fr. Parliament. The cap. is Basse-terre, to the S.W. of the Soufrière, situated near rugged and remarkably beautiful country. It dates from 1613, but its glory has departed with the development of Pointe-à-Pitre on Grande-terre. The latter is a picturesque tn. (pop. 41,000) of well-built houses which are mostly of stone with upper storeys of wood, many painted in gay colours. It has a cathedral in Place de l'Église, and also a fine harbour, and is the prin. commercial centre. Iron and lime phosphates are to be found in the dependencies, also calcareous stone quarries in Grande-terre. The is. was discovered by Columbus in 1493, but no colony was founded until Duplessis and de l'Olive landed in 1635 and took possession in the name of France. In 1759 it was taken by the Eng., but recovered by the Fr. in 1763, at the end of the Seven Years war. In 1794 Pointe-à-Pitre and Basse-terre were captured by an expedition under Sir Charles Grey and Sir John Jervis (who was later created Earl St. Vincent), but two months later the notorious Victor Hugues, commander of the convention, landed at Gosier and drove the Eng. from their positions. Jervis returned and compelled the Fr. to surrender; but Hugues rallied his followers and inflicted a defeat on the Eng., after which Jervis re-embarked his forces and withdrew. After the withdrawal of Grey and Jervis in 1794 some 300 Fr. royalists who had assisted them were guillotined or shot by Hugues. Off Pointe-à-Pitre on June 5, 1794, took place

the five-hour sea-fight between the *Blanche*, under Capt. Robert Faulknor, known as the Undaunted, and a Fr. frigate *Pique*, Faulknor being killed as he was lashing the bowsprit of the *Pique* to his own ship for the second time (see Sir A. Aspinall, *A Wayfarer in the West Indies*, 1928). In 1810 the Eng. again seized the is., but it was restored to France in 1814. In the following year it was again taken by the Eng. after the battle of Waterloo and administered by them on behalf of the legitimate gov. of France until 1916, when a Fr. gov. took over control. There are good roads but only one small railway. A regular steamboat service is carried on by both Fr. and Eng., and there is a telegraph and telephone service on the is. A wireless station was opened at Desiré in 1918. There are good educational facilities, both public and private elementary schools being estab. Pop. 304,200.

Guadiana, riv. of Spain, the Zancaná, which rises in the prov. of Cuenca, being its head stream. Not far from the Zancaná are the lakes known as Los Ojos. The G. flows westward through La Mancha and Extremadura to Badajos, where it assumes a southerly direction forming a boundary between Spain and Portugal. The riv. is about 500 m. long, its chief tributaries being the Javalón, Zujar, and Ardila.

Guadix, city of N. Spain in Granada, situated on the R. G. There are mulberry plantations, and in the vicinity are the warm mineral springs of Gruena. It contains a cathedral and the ruins of an old Moorish castle. Pop. 16,000.

Guaduas, tn. of Colombia, S. America, situated 45 m. N.W. of Bogota, in the dept. of Cundinamarca, over 3000 ft. above sea level. Pop. 12,900.

Guagua, tn. and com. of the is. of Luzon, Philippine Is. It is situated in the prov. of Iampanga. Pop. 10,500.

Gualdo Tadino, com. of Italy in the prov. of Perugia, situated about 58 m. from Ancona, on the road leading to the Furlo Pass. It possesses a noted cathedral. In the vicinity Totila was defeated by Narses in 552. Pop. 11,000.

Gualeguay, tn. in the prov. of Entre Ríos, Argentina, about 8 m. from Porto Ruiz. Pop. about 16,000.

Gualeguaychú, riv. port in the prov. of Entre Ríos, Argentina, situated on the R. G., about 9 m. from its confluence with the Uruguay. Trades in meat extracts. Pop. about 20,000.

Guam, Guahan, or Guajan, largest and most S. of the Ladrones or Mariana Is. Magellan is said to have discovered the is. in 1521. It was ceded by Spain to the U.S.A. in 1898 and therefore did not come under the Jap. mandatory control of the rest of the Marianas Archipelago which had been sold by Spain to Germany in 1899. It is maintained as an Amer. military outpost. The is. is 30 m. long, from 1 to 8½ m. broad, and has an area of some 205 sq. m. The surface is mountainous and the coast surrounded by coral reefs. The best harbour is Apra on the W. coast. The products of G. are maize, sweet potatoes, taro, copra, rice, banana,

citrus and other fruits, papayas, sugar-cane, breadfruit, cassava, and coco-nuts. The native inhab. of G., the Chamorros, are classified among the Micronesians. G. was captured by the Jap. on Dec. 12, 1941, and retaken by Amer. forces on Aug. 10, 1944. Agaña, the seat of naval government, was destroyed during the reoccupation. It is being rebuilt on the same site, which is about 8 m. from the anchorage in Apra harbour. The port of entry is Piti. It is closed to foreign vessels of war and commerce except in special cases. There is a gov. radio station on the is. Commercial and gov. transportation by ship is available at regular intervals. The governor of G. is a rear-admiral appointed by the Amer. President, and he is also the senior naval commander of the 'trustee' is. in the W. Pacific area. He and his staff constitute the executive, and the Guamanian congress form the legislature. The congress is elected biennially and its powers are similar to those of an Amer. state legislature. The judiciary comprises an is. court, a Justice court, besides a court of appeal. Elementary education is compulsory. In 1947 there were 8400 pupils in twenty-two elementary and three high schools and there is also a teachers' college. The educational standards are stated to be equal to those of the more advanced states of the U.S.A. Pop. 22,000. See W. H. Haas (editor), *The American Empire. A Study of the Outlying Territories of the United States*, 1940; L. Thompson, *Guam and its People*, 1911; and F. M. Keesing, *The South Seas in the Modern World*, 1942.

Guamo, tn. of Colombia, situated to the S.W. of Bogota. Pop. about 11,000.

Guan, bird belonging to the family Gracidae, sub-family Peleopodinae, native of Central and S. America. These birds are characterised by bare throats and wattles. They are gregarious birds, and are usually to be found in forests. Their colour is olive-green or brown, and several of the species are capable of being domesticated.

Guanabacoa, tn. of Cuba, 3 m. E. of Havana. It is built on high land and is well provided with public buildings. It is connected by rail and motor road to Havana, of which it is a residential suburb. There are medicinal springs in the tn. Pop. about 19,000.

Guanacaste, prov. of Costa Rica, including the peninsula of Nicoya. The surface of the prov. is covered by large forests, and is well provided with land suitable for grazing. The cap. is G. or Liberia. Pop. (prov.) 90,100; (tn.) about 8000.

Guanaco, wild species of the camel family, the llama and alpaca being the domesticated varieties. It is of a reddish-brown colour, and is a native of S. America, found particularly on the Andes and generally living in herds.

Guanajay, tn. in the prov. of Pinar del Rio, Cuba. It lies 35 m. S.W. of Havana and is noted as a health resort. Pop. about 6000.

Guanajuato: 1. State of Mexico, bounded

on the N. by San Luis Potosí, on the S. by Michoacan, on the W. by Jalisco, and on the E. by Querétaro, with an area of about 10,950 sq. m. This state lies in the central plateau of Mexico, and its surface is very mountainous, the Sierra Gordo and Sierra de G. being the highest ranges. The chief riv. is the Río Grande (de Lerma), and the cap. G. G. is exceedingly rich in minerals. The silver-mines are of the greatest importance, being worked since the Sp. conquest. Pop. (1940) 1,046,100. 2. Cap. tn. of the state of G., situated to the N.W. of Mexico. This city consists of a number of vlls. placed round the mines, and being on uneven ground has steep and winding streets, well-built houses, and a generally oriental appearance. Among its chief buildings are the Alhondiga, a cathedral, mint, univ., and theatre. In addition to the silver and gold mines which are near, G. manufactures pottery, chemical, and other articles. Pop. 20,000.

Guanare, cap. of the state of Zamora, Venezuela. It is noted for its trade in Venetian glass. Pop. 11,000.

Guanavelica, see HUANCAVELICA.

Guanches, or **Guanchos**, race originally found in the Canary Is. They were finally conquered by the Spaniards about the end of the fifteenth century, and at the present time are nearly extinct. The character of their skull—low forehead and projecting jaw—shows a likeness to the Cro-Magnon race of France, while their language and inscriptions point to a connection with the Berbers of N. Africa. See S. Berthelot, *Antiquités Canariennes ou annotation sur l'origine des peuples qui occupèrent les îles fortunées depuis les premiers temps jusqu'à l'époque de leur conquête*, 1879.

Guanes, tn. in Cuba, situated in the centre of flourishing tobacco, cotton, and coffee plantations. It is 120 m. S.W. of Havana in the prov. of Pinar del Rio. Pop. 10,500.

Guanine ($C_4H_5N_0$), highly nitrogenous base containing the uric acid nucleus found in guano and other animal products. It forms a white insoluble powder which is converted by nitrous acid into xanthine, a substance present in tea.

Guano (derived from the Peruvian word *huano*, dung), excrement of certain sea-fowl, e.g. gulls, cormorants, and penguins, together with other animal remains such as feathers and bones. It is used largely as a manure, its value as such depending on the fact that it is a general fertiliser yielding all the constituents of plant food in a condition that can be readily assimilated. The chemical composition is extremely complex and varies according to the locality and age of the deposit. The main constituents are nitrogenous (uric acid) and phosphatic (calcium phosphate) compounds, together with various potassium and ammonium salts and a nitrogenous substance, guanino (q.v.). The most highly nitrogenous and therefore most valuable G. (containing nitrogen from 13 to 14 per cent, and phosphoric acid to the same amount) has been imported since 1840 from the Chincha Is. off Peru. In Peru the G. deposits now belong to the gov. and exports have been

forbidden since 1941. According to Boussingault, one ton of this is equal to about thirty tons of farmyard manure or dung. The best supplies of G. are now practically exhausted, and low quality grades are now 'fortified' with ammonium sulphate. Natural G. is one of the prin. exports of Seychelles. There are large deposits of phosphatic G. in Ocean Is. (Gilbert and Ellice Is. Colony) and the colony is almost entirely dependent on their exploitation. Whale G. is a fertilizer containing about 8½ per cent of ammonia and 21 per cent of tribasic phosphates of lime.

Guantanamo, tn. In the chief coffee-growing dist. of Cuba, 13 m. N. of Caimanera, its port, and 49 m. E. of Santiago de Cuba. One of the four naval stations ceded to the U.S.A. by Cuba in 1901. Exports sugar and lumber, and has a good harbour. Pop. (1913): City, 42,423; municipality, 91,737.

Guapal, or **Rio Grande**, riv. in Bolivia rising in the dept. of Cochabamba. Trib. of the Mamore, into which it runs after a circuitous course of 550 m.

Guarani, **Guarany**, or **Guaranies** ('warriors'), S. Amer. aborigines, one of the chief groups of S. Amer. Indian tribes, who lived between Parana R. and the Atlantic. The name is also applied to a great linguistic family Tupi-G., which formerly occupied Paraguay, Uruguay, and Brazil, with branches also in Bolivia and Peru. These numerous tribes were distinguished by the same language and similar customs. They cultivated the manioc and other plants, and had developed various peaceful arts. They were usually friendly with the whites and easily subdued. The modern pop. of Paraguay are largely descendants of the G. and the Spaniards with whom they intermarried. The Jesuits estab. important missions among them. The G. language has Mongolian characteristics, and was early adopted by missionaries as the *lingua geral*. See Martius, *Ethnographie und Sprachenkunde Amerikas*, 1867; Brinton, *The American Race*, 1891; and M. S. Bertoni, *La Civilización Guarani*, 1922.

Guarantees, or **Contract of Suretyship**, promise to be collaterally responsible for the debt or default of another person, the prin. debtor. It is to be distinguished from an indemnity (q.v.) because no liability arises until the prin. debtor has made default. A G. is within the Statute of Frauds (see *FRAUDS, STATUTE OF*), and hence is unenforceable unless evidenced by writing; but the writing need not contain any statement of consideration (q.v.) given to the surety in return for his G. The practical effect of this is that a surety cannot be successfully sued if he can prove that there has been no consideration, but that where consideration has been given, it is no defence that it is not stated in writing. A valid contract of suretyship must be made with the creditor, and the guarantor must be under no liability in the prin. contract. It seems now to be settled law that a surety cannot compel the creditor to sue the debtor before having recourse to him, for the creditor can sue

the surety without even informing him of the debtor's default. Any fraudulent concealment or wilful misrepresentation on the part of the creditor inducing the G. will entitle the guarantor to repudiate the G., and if the creditor alters the terms of the G. without the consent of the surety, the latter is discharged, as also if he takes a new security from his debtor in substitution for the original security. On payment of the debt the surety has the right not only to recover from the prin. debtor the full amount of the debt with interest, and costs reasonably incurred in disputing the claim, but to be subrogated to all the rights, equities, and securities given by the prin. debtor to the creditor. A discharge in bankruptcy of the prin. debtor or the acceptance by the creditors of a scheme of arrangement does not release from liability a person who was surety for his debts (Bankruptcy Act, 1914). See T. Hewitson, *Suretyship*, 1927.

Guarantees Associations, associations or insurance companies which issue policies guaranteeing the assured against the default or insolvency of his debtors; or, specifically, fidelity policies or bonds to guarantee the assured against dishonesty of a servant or employee. Contracts to issue such policies are within the Statute of Frauds (see *FRAUDS, STATUTE OF*), and must therefore be in writing. In the case of fidelity bonds the employer must disclose to the G. A. any knowledge he may have respecting previous defalcations on the part of the employee whose integrity is the subject of the policy of bond. It is a defence to an action on a fidelity policy that the assured has been negligent in supervising the employee. If during the currency of a fidelity policy the employee is guilty of any dereliction of duty justifying his dismissal, the assured must give notice to the G. Association, even although the conduct of the employee has given rise to no claim upon the policy. Speculation or gambling on the part of the employee must also be disclosed where the policy contains a condition to the effect that the employer must give notice on becoming cognisant of such fact. Guarantee policies against insolvency or default of debtors must be distinguished from ordinary contracts of guarantee (see *GUARANTEE*). Full disclosure must be made as in the case of fidelity bonds, whereas in ordinary guarantees such disclosure is not essential. The G. Association is discharged from liability, generally speaking, if the creditor consents to any alteration in the liability of the debtor.

Guarayos, aborigines of S. America. They are found chiefly in the forest land of Bolivia. They have never been fully civilised, and all attempts to bring them under the permanent influence of civilisation have been frustrated by their fierce and barbarous habits. They cultivate maize and plantains.

Guard, National, see *UNITED STATES, Army*.

Guarda, name of a fortified tn. and dist. in Portugal. The dist. forms part of the prov. of Beira. It is situated just over

70 m. N.E. of Coimbra. It has a bishop's palace, cathedral, and old castle. Pop. (dist.) 294,100; (tn.) about 6000.

Guardafui, N.E. extremity of E. Africa, situated at the S. entrance of the gulf of Aden.

Guardi, Francesco (1712-93), Venetian painter. His greatest works are to be found in the Manfrini Palace at Venice. He was a pupil of Canaletto, whose style he followed closely. See lives by G. Fiocco, 1923, and M. Tinti, 1930.

Guardiagrele, city in the prov. of Chieti, Italy, 18 m. S.W. of Ortona, and possessing mineral springs. The fourteenth- and fifteenth century church of San Francesco and the church of Santa Maria Maggiore were badly damaged in the battles of 1914. Pop. 8000.

Guardian, in Eng. law the person who has the legal control of another, usually a minor or a person of weak intelligence, and who also has the management of his property. A child's natural G. is the father or mother, but when they are dead one or two G.s. are generally appointed by will. A G. may therefore be such by nature, e.g. the parent or parents or other ancestor, or by statute; or a judicial G., appointed by the chancery div. of the high court. The powers of the G. are much the same as those of the parent (see PARENT AND CHILD). A G. is appointed by the court when disputes arise; and it is to the chancery court that a G. can appeal if in a serious difficulty with his ward. In Scotland a G. is termed a tutor. The consent of the G. is necessary for the marriage of an infant ward, unless the court dispenses with it. A different kind of G. was the person elected to look after the administration of the Poor Law. There was a board of G.s. in each union of pars., but these boards were abolished in 1929 when their duties were assigned to Public Assistance Committees appointed by the co. and co. bor. councils. See POOR LAWs.

Guardian's Allowances, see under NATIONAL INSURANCE ACT (1946).

Guardians, Board of, see POOR LAWS.

Guards, Dragoon. Prior to the First World War there were seven regiments of D. G.: the 1st (King's), 2nd (Queen's Bays), 3rd (Prince of Wales's), 4th (Royal Irish), 5th (Princess Charlotte of Wales's), 6th ('Carabiniers'), and 7th (Princess Royal'). After the war the progress made in mechanisation (q.v.), combined with the need for economy, resulted in the amalgamation of many of the old cavalry regiments and eventually in their conversion into armoured car or tank units.

All the old regiments of D. G., except the 7th, were raised at the time of the Monmouth rebellion of 1685. The 1st (King's) acquired their title 'King's' in 1746. They fought, as did most of the other regiments of D. G., in Marlborough's campaigns, also in the S. African War, and at Ypres and Loos in the First World War. The Queen's Bays fought at the battle of the Hoyme as the 3rd Regiment of Horse, and their present name was given in the time of the Seven Years'

war. In the First World War they fought at Mons, Le Cateau, Néry, Gheluvelt, and at various points in the Ypres salient. The 3rd D. G., the old-time 4th Regiment of Horse, fought under Marlborough as 'Wood's Horse' and received their title, 'Prince of Wales's,' in 1768. Besides taking part in Marlborough's campaigns, they fought in the Peninsular battles; and, in the First World War, at Hollibecke, Klein Zillebeke, and Gheluvelt in the first battle of Ypres, and in 1915 took part in combined cavalry operations in the second battle of Ypres. The Royal Irish D. G., raised in 1697 as 'Arran's Cuirsassiers,' received their present name in 1788, and fought with distinction at Balaklava and other Crimean battles, and at Tel-el-Kebir. In the First World War they are credited officially with being the first Brit. troops to come into contact with the Gers., charging and routing a column of Uhlans at Jemappes on Aug. 20, 1914. They also fought at Mons and at various places in the Ypres sector. The 5th D. G. were the former 2nd Green Irish Horse of 1717; they also fought in Marlborough's battles, and in those of Wellington. In the First World War they were at Lo Cateau, Néry, and Ypres. The Carabiniers, formerly the 8th Regiment of Horse, became the 3rd Irish Horse in the '45 rebellion and the Carabiniers in 1788. Besides taking part in Marlborough's campaigns, they fought in the Afghan war of 1879 and at Paardeberg in the S. African war. Like other regiments of cavalry, their fighting in the First World War was mainly in the capacity of infantry in 1914, notably at Gheluvelt. The 7th D. G. were raised in 1689 by the first duke of Devonshire to support the Protestant cause during the revolution. At the battle of the Hoyme they fought as Schomberg's Horse. After Marlborough's battles their commanding officer was the famous Jean Louis Lord Ligonier (q.v.). Their other battles prior to the First World War included Dettingen and Tel-el-Kebir. In the First World War they were at the battle of the Somme, 1916, being especially prominent in the stiff fighting around Bapaume and Longueval.

Mechanised, and fighting as units of the Royal Armoured Corps, all the D. G. regiments won new honours in the Second World War. The 1st King's D. G., in action in the first Libyan campaign, served in the W. Desert and Tunisia until the destruction of the Axis armies in N. Africa. In Italy they led the fighting advance of the Fifth Anglo-Amer. Army to Naples. They also fought as infantry. In Dec. 1944 they went to Greece to restore public order in Athens and Attica. The 2nd D. G. (the Queen's Bays) served in the W. Desert and in Tunisia with the Eighth and First Armies. They fought in the Knightsbridge battles, the withdrawal into Egypt, and at El Alamein. In the pursuit to Tunis they were part of the armoured desert wing whose surprise turning movement drove the enemy from his Mareth defences. They were continuously in action in the It. campaign between the spring of 1944 and the early

summer of 1945. The 3rd D. G. (the Carabiniers) were the only tank unit in the garrison of Imphal (Burma), besieged by the Jap. in the summer of 1944. Some of their tanks climbed slopes of over 35 degrees, and, after the Jap. failure, mounted the Chocolate Staircase to Tiddim and fought their way up Kennedy Peak, 8500 ft. high. Crossing the Chindwin and the Irrawaddy they helped to capture Mandalay, Prome, and Rangoon. The 4/7th D. G. were among the first armoured troops to land in Normandy in June 1944. They were engaged in the heaviest fighting of the Caen-Falaise battles until mid Aug. The first armour across the Seine, they fought at Arnhem, and, in the following Feb., were the first Brit. troops to link up with the Amers against the Ger. counter-offensive in the Ardennes. They crossed the Rhine with the 51st Highland Div. and supported the 3rd Brit. Infantry Div. in the capture of Bremen. From 'D' Day until the end of the war they destroyed 100 Ger. tanks and many self-propelled guns and machine-gun posts. The 5th Royal Inniskilling D. G. also landed in Normandy among the first armoured troops. They were in action continually during the Caen battles from mid June until late Aug. In the sweep from the Seine to the Scheldt they drove from the neighbourhood of Amlens to the region of Ghent in three days. After crossing the Rhone they led the way into Hamburg.

Guards (Household Troops) (from Fr. *garde*). G. form the oldest part of estab. armies, in fact it is probably from the G. that the army, as we know it, is derived. Formerly it was customary for the sovereign to depend upon the national levy for his soldiers, but gradually there grew up the nucleus of a standing army in the formation of bodies of personal G. for the king. In England these took the form of the house carles, a body probably first brought into England by Canute. Hist. gives us many examples of G. playing an important part in the affairs of their country. In this respect we may mention the house carles of Harold who d. almost to a man round his body at Hastings, the Swiss G. of Louis XVI., who perished defending their king, and the Old Guard of Napoleon, the veterans upon whom he depended when all else had failed. These are but a few examples. The G. of the king at the present time may be distinctly divided into two groups: the first, those gentlemen and retainers who form a purely personal bodyguard, and secondly those regiments which are brought into closer contact with the sovereign than usual, but who form part of the active army as well. To the first div. belong the Honourable Corps of Gentlemen-at-Arms, the Yeomen of the Guard, together with the Royal Company of Archers, who form the King's Scottish bodyguard. The two former owe their origin to the Tudor monarchs. The oldest of all these bodies is the Yeomen of the Guard, founded by Henry VII. Next came the Honourable Company of Gentlemen-at-Arms, founded at the accession of Henry

VIII. The Scottish Company of Archers was founded by Act of the Privy Council of Scotland during the reign of Charles II. The second section of G. consists of certain regiments from the active army. These, again, may be divided into two sections: the Household Cavalry and the Foot G. The Household Cavalry was founded at the Restoration. There are three regiments of Household Cavalry which were originally at the Restoration the King's Troop, the Queen's Troop (formerly the Lord-General's Troop), and the Duke of York's Troop. Later the name of the Life G. was given to the first two troops (1685) and finally was raised a third troop, known variously as the Duke of York Blues, the Royal Horse G. Blue, and the Royal Horse G. (the Blues) (*see LIFE-GUARDS*). The Foot G. of the Household Troops consist of five regiments, the Grenadiers, the Coldstreams, the Scots G., the Irish G., and the Welch G. See also under the names of the regiments.

Guardship, name applied to a ship which is posted at some port to act as guard. Usually she is the headquarters of the various coastguard dists. and is stationed at a certain point with a nucleus crew. The crew can easily, however, be brought up to strength, and can then proceed immediately to action. The name of guard-boat is also applied to a boat which sails round an anchored fleet at night in order to see that proper watch is being kept. Formerly the term was applied to that ship of the fleet which received the men from the press-gangs.

Guarico, name of a state of Venezuela. It was formed in 1901 from a portion of the state of Miranda. It has an area of about 25,500 sq. m., and its cap. is San Juan. Pop. 135,000.

Guarini, Giovanni Battista (1537-1612), It. poet, b. at Feirara, and remembered for his drama, *Il Pastor fido*, which he wrote under the influence of Tasso. The poem has been trans. into Eng. See monograph by V. Rossi, 1886.

Guarino (c. 1370-1460), It. scholar, b. at Verona. He is chiefly remembered for having helped to establish the texts of many of our classics. He trans. Strabo and some of the lives of Plutarch. See life by R. Sabbatini, 1891.

Guarneri, surname of a famous It. family of violin-makers who lived and worked at Cremona:

Andrea Guarneri (1626-98), pupil of Nicholas Amati, whose marriage he witnessed in 1641. Many of his violins are of the Amati pattern, but are inferior to those of his master; his 'cellos possess fine acoustic properties.

Giacoppe Guarneri (1666-1739), son of Andrea G., introduced a narrow-waisted and more boldly curved instrument, with the sound-holes set lower down, and in its power of sound is superior to his father's.

Pietro Guarneri (c. 1690-1728), second son of Andrea G., introduced greater width between the sound-holes; his varnish was of exquisite gold and pale red tints.

Pietro Guarneri (c. 1725-80), son of Giuseppe G., who produced some very fine instruments.

Giuseppe Antonio Guarneri (1683-1745), nephew of Andrea G., and greatest genius of the family. His violins are of bold and massive build, with grand sonority of tone, and some of his finest date from about 1740. See A. E. Brinckmann, *Von Guarini bis B. Neumann*, 1932.

Guarroman, tn. in prov. of Jaen, and 28 m. N. of tn. of same name, Spain. A lead-mining centre. Pop. 3500.

Guastalla, sanc. city of N. Italy, situated on the R. Po, about 20 m. N.E. of Parma. It has a cathedral and a school of music. It is the seat of a bishop. Pop. 13,000.

Guatemala: 1. Republic of Central America. The name is probably of Aztec origin and is said to mean 'land of the eagle' in its original form of Quauhmetlán. It is bounded by Mexico, Brit. Honduras, Honduras, and Salvador, with the last-named of which states G. united in 1945. Salvador formed part of the Sp. royalty of G. until 1831 and the two countries have the same language and religion. It is divided into five regions, the lowlands of the Pacific coast, the volcanic mts. of the Sierra Madre, the plateaus N. of these, the mts. of the Atlantic versant, and the plain of Petén. It is richly watered and there are several extensive lakes. The bird life of the country is rare. The climate is healthy, save on the coast, where fever is prevalent. The rainfall in the cap. is 67 in. per annum. The country is rich in minerals, but owing to lack of transport mining is little developed; other important products are coffee, honey, bananas, sugar, wheat, cotton, rubber, timber, maize, and chicle gum. Important cattle estates exist upon the Pacific coast and cattle and hides are exported besides the above mentioned products. No part of Central America contains a greater diversity of tribes. There are eighteen languages spoken. The chief tn. is G. la Nueva. The prevailing form of religion is Rom. Catholic, but the state recognises no distinction of creed. No convents or monasteries are allowed. For the white and mixed pop. military service is compulsory. The republic was set up in 1839, having been a part of the Central Amer. confederation for eighteen years. The existing constitution was promulgated in March 1945. A single-chambered national assembly or Congress has the legislative power. Its members are chosen for four years by direct popular vote; one-half are renewed every two years, and deputies are not eligible for re-election until one term has elapsed. The President is elected for six years, and re-election is forbidden for a period of twelve years. President Ubico's term, expiring in 1937 was extended to 1949 by a plebiscite in 1935, and a constitutional amendment, in 1941. However, there was a rebellion in 1944 which overthrew him, and under the new constitution the ban on immediate succession is explicit, the right of rebellion in its defence being expressly sanctioned. All males over eighteen, and literate females over the same age, are enfranchised. Nine executive depts. conduct the administration under the President. The assembly

consists of deputies for each 50,000 inhab.; it declares war, governs national finance, and controls concessions. There are some 720 m. of railway. There is direct communication with the U.S.A. and Mexico, and a line is now open into Salvador. There is also an electric line from San Felipe to Quezaltenango. Road-making has increased of more recent years and there are excellent roads radiating from G. city. There are eight wireless stations. There are regular mails to England and the U.S.A., and small steamers and motor boats ply on the rvs. and lakes. Air mail and passenger service connect G. city with Quezaltenango, Tegucigalpa, San Salvador, Panama, and Mexico city.



E.N.A.

GUATEMALA: INDIANS BOARDING A LAUNCH AT SAN LUCAS TALIMON

Atitlan volcano is seen on the right.

Archaeologists have brought to light remains of three civilisations, described by the late Dr. T. T. Waterman, of the National Museum of Guatemala, as (1) Zapotec (or Aztec); (2) Maya (older than Zapotec); (3) a nameless culture older than either. Interesting ruins of ancient settlements with mounds and pyramids are found in the coast region of W. G., not far from the railway line connecting G. City with the port of San José. Valuable archaeological work has been done by the staff of the National Museum in G., but a great deal of new exploration is desirable. In addition to large architectural works much eroded by rainfall and masked by vegetation, there are other relics, notably fragments of pottery and chips of obsidian. Scattered over the sites are large building stones of volcanic material, beautifully squared and dressed. Some of the buildings bear colossal heads, carved in stone, and apparently used to ornament façades. At Baúl and Pantaleón there are carvings of marked artistic merit.

The Maya remains near Quiriguá may be compared with those still nearer to the Honduras border at Copán. Others exist northward in the remote Petén dist. at Tikal and, westward, at Chacultí (Iluéhuetenango). The monuments at Cotzumalguapa (S. of Escuintla), at Mitla (Jutiapa), at Utatlán (Quiché), and Tecpán are later (*South American Handbook*).

G. was conquered by the Spaniards under Pedro de Alvarado between 1522 and 1524. On G.'s 'claim' to the ownership of Brit. Honduras see *Honduras*. Pop. 3,285,000 (with Salvador 5,115,000) (60 per cent Indians). Chief tns.: G. city (q.v.), Quetzaltenango (30,000), Cobán (27,000), and Zacapa (18,000). Chief seaports are San José de G. and Champerico on the Pacific and Livingston and Puerto Barrios on the Atlantic side. See also *SALVADOR*.

2. Cap. of the republic G. (sometimes written G. la Nueva and formerly Santiago de los Caballeros de G.), until 1821 cap. of the Sp. captaincy-general of G., which comprised Chiapas in Mexico and all Central America except Panama. G. is built more than 5000 ft. above sea level, in a wide table-land traversed by the Rio de las Vacas, or Cow R., so called from the cattle introduced here by Sp. colonists in the sixteenth century. The edge of the table-land is marked by deep ravines. Beyond it are lofty mts., the highest peaks being on the S., where the volcanic summits of the Sierra Madre exceed 12,000 ft. It has a station on the transcontinental railway from Puerto Barrios on the Atlantic (190 m. N.E.) to San José on the Pacific (75 m. S. by W.) and to Champerico via Retahuleu. Connection is made at Ayutla with the National Railways of Mexico. It is three times the size of any city in the republic and has a corresponding commercial superiority. Its archbishop is the primate of Central America (excluding Panama). Like most Sp.-Amer. tns. it is laid out in wide and regular streets which are often planted with avenues of trees, and it has large suburbs. Though usually only of one storey, the houses are solidly and comfortably constructed. Many of them have large gardens and courts surrounding them. In 1918 a severe earthquake destroyed many of the public buildings, but in the business quarter many fine new buildings have been erected. The chief of the open spaces is the Plaza Mayor which contains the cathedral, built in 1730; then there are the archiepiscopal palace, the gov. buildings, the mint, and other public offices; and the more modern Reforma Park and Plaza de la Concordia, now the favourite resort of the inhab. A univ. was estab. in 1918. There are a number of schools for both sexes, besides hospitals and an orphanage. Many of the prim. buildings in the place were originally convents. In 1858 a theatre was founded which is one of the best in Central America. A museum founded in 1734 is maintained by the Sociedad Económica, which in various ways has done great service to the city and to

the country. There are a couple of fortresses, the Castillo Matañoros, built by Rafael Carrera, and the Castillo San José. Water is brought from a distance of about 8 m. by two old aqueducts from the tns. of Mixco and Pinula, but municipal improvements to the drainage and water supply have been made. Fuel and provisions are largely supplied by the Pokonan Indians of Mixco. The general prosperity of G. has secured for it the name of the Paris of Central America. A new highway through Antigua to San José was opened in 1925. The foreign trade up to the Second World War was largely controlled by Gers. who owned one-third of the coffee plantations. Pop. 177,000. See D. Fifo, *Guatemala and the States of Central America*, 1913; J. V. Mejía, *Descriptive Geography of the Republic of Guatemala*, 1922; E. Ferguson, *Guatemala*, 1937; C. L. Jones, *Guatemala: Past and Present*, 1940; J. Muñoz and A. B. Ward, *Guatemala. Ancient and Modern*, 1940; and V. W. von Hagen, *Maya Explorer: John Lloyd Stephens and the Lost Cities of Central America and Yucatan*, 1947.

Guatemala Antigua (old G.) is situated 20 m. S.W. of the present cap., 5000 ft. above sea level. It was once a splendid city, but it has been destroyed sev. times by earthquakes. In the eighteenth century it had a pop. of 40,000, a univ., and over 100 churches and monasteries. The present tn. is surrounded by picturesque coffee estates. Pop. 10,000.

Guatusos, aborigines of Central America, a S. branch of the Chorotegans, whose home is in Costa Rica. They are generally a peaceful race, and still retain their primitive tribal arrangements and their independence.

Guava, or *Psidium Guajava*, species of Myrtaceae found in tropical America. It is a tree which bears white flowers, followed by a succulent edible yellow fruit which is often used in making Juices and preserves. The black G. is *Gustavia urens*, a species of Rubiaceae.

Guayama, tn. of Puerto Rico. The tn. is situated in the centre of the cane-growing industry, and has a large trade in molasses, sugar, and rum. Pop. about 15,000.

Guayaquil, chief port of Ecuador, S. America. It is the cap. of the prov. of Guayas and is 40 m. from the mouth of the riv. of that name. The climate is extremely unhealthy, and the tn. is badly built. The newer part of the tn. where the wealthier residents live is far better than the old. The streets of the old tn. are dirty and badly paved. Much improvement has been made in more recent years; the sanitation is modern and the conditions of public health are satisfactory from May to Dec. The tn. is the seat of a bishop, and has a cathedral, a bishop's palace, a univ., a technical school, and three theatres. The chief exports are cacao, Panama hats, cotton, tobacco, and coffee. It has also shipbuilding yards, steam saw-mills, foundries, machine shops, and breweries. The snow-capped peak of Chimborazo can sometimes be seen from

the city. There was a Ger.-owned bi-weekly air service between Quito and G. before the Second World War, but it was suspended in 1941. There is an Amer. air service from Cristobal to G. There is a wireless station. Pop. 136,000.

Guayaquil, Gulf of, inlet of the Pacific Ocean on the W. coast of S. America.

Guayas, stretch of ter. on the S.W. coast of Ecuador forming a prov. of that country. The land is generally low-lying and is extremely fertile. The chief products are coffee, tobacco, sugar cane, and rice. Area 11,500 sq. m. Pop. 441,600.

Guayacuru Language, see under SOUTH AMERICA IN NATIVE LANGUAGES.

Guaymas, Mexican seaport situated on the gulf of California in the state of Sonora. The chief exports are pearls and silver ore. The climate is unpleasant in summer. Sea-fishing is good. Pop. 15,000, including a number of Chinese.

Guaya, La, see LA GUAYRA.

Gubat, small port on the E. coast of Albay prov., Luzon, Philippine Is. Exports copra and hemp. Pop. 16,500.

Gubbio, city of Central Italy, 27 m. S. of Urbino in the prov. of Perugia, delightfully situated on the slopes of the Apennines. It has a picturesque medieval appearance with its thirteenth-century cathedral, a communal palace of the fourteenth century, and many old convents and churches. G. was celebrated for its majolica ware, which is still imitated in a few factories. The famous Eugubine Tables (q.v.) are kept here. The cathedral roof was damaged in the Second World War, but the tn. itself suffered little damage. Since its incorporation in the duchy of Urbino (1384) the pop. has dwindled from 30,000 to 6000.

Guben (Polish Gubin), walled manufacturing tn. of Poland (formerly Prussia) on the Neisse, 28 m. S. of Frankfort-on-the-Oder. Industries: woollen, linen stuffs, hats, machinery, earthenware, dolls. Pop. 13,900.

Gubernatis, Angelo de, see DE GUBERNATIS, ANGELO.

Gubin, see GUBEN.

Gudalur, see CUDALORE.

Gude, Hans Fredrik (1825-1903), Norwegian painter, pupil of the Dusseldorf Academy (1841) and prof. there (1854). He went to England (1862), and became prof. at Karlruhe arts school (1861) and at Berlin Academy (1880-1901). He is perhaps the finest Norwegian landscape painter, and won numerous medals in Europe and America. Among his chief works are 'Early Morning in the Mountains of Norway,' exhibited 1873; 'A Scotch Landscape,' exhibited 1878; 'Bridal Procession on Hardanger Fjord' (1848); 'Cath. Sac.'; 'Fishing by Night'; 'Fishermen Landing'; 'A Viking Ship'; 'After the Storm'; 'Harbour of Christiania' (1881). See J. B. Atkinson, *A Tour to the Northern Capitals of Europe*, 1873; L. H. S. Dietrichson, *Af H. Gude's Liv og Tarker*, 1899.

Guden-Aa, chief riv. of Jutland, Denmark, about 80 m. long. It flows N.E., joining the Cattegat by an estuary 1 m. wide, about 16 m. N.E. of Randers.

Gudgeon, cyprinid fish of Europe and N. Asia. Rarely exceeds 7 in. in length. Has a barbel on each side of jaw, and is greyish, with dark blotches. It prefers clear streams with gravelly bottoms.

Gudrun, or Kudrun, heroine of a Middle High Ger. thirteenth-century epic (author unknown), the Ger. *Odyssey*, next important in early Ger. literature to the *Nibelungenlied*. She was the daughter of King Hettet of Hegelingen (Frisia-Land). The epic deals with legends mainly of the North Sea coasts and Normandy. E. Martin's ed. (1902) is the best modern one. There are modern Ger. versions by C. J. Simrock (1813); G. Freytag (1888); and others. See also Wilmann, *Die Entwicklung der Kudrundichtung*, 1873.

Guebres, Guebers, Gabers, or Ghebres (Persian *ghebr*; cf. *Giaour*), name (meaning infidels) applied in Persia to the adherents of the anc. religion, Fire-worshippers, Zoroastrians, or Parsis. They number about 8000 or 10,000, and call themselves Beh-Dinān ('those of the Good Faith'). See E. Taylor, *Primitive Culture*, II., 1871.

Guebwiller (Ger. *Gebweiler*), tn. of Haut-Rhin, France, at the mouth of the Blumenthal, at the E. foot of the Vosges. It has a twelfth-century church in the Transitional style and a fourteenth-century Dominican church. Its manus. include soap, brick, cotton, and woollen goods, and machinery. Pop. 10,000.

Guedalla, Philip (1889-1944), Eng. biographer, educated at Rugby and Balliol College, Oxford. Practised law for some years. First made his mark with *Superers and Supermen*, a vol. of biographical essays (1920). This was followed by lives of Palmerston, Wellington, and Gladstone, all highly individual contributions to the hist. of the nineteenth century. In *The Hundred Years* (1936) he depicted the century from the accession of Victoria and in its sequel, *The Hundredth Year* (1940), he gave a vivid impression of the events of that year as a turning point in modern affairs. During the Second World War he pub. a penetrating sketch of Mr. Winston Churchill and a study of Brit. air strategy in the Middle E. (commissioned by the Air Ministry), which was pub. on the day of his death. His great interest in Lat. America was shown by his visits there and by his books *Conquistador* (1927) and *Argentine Tango* (1932). As a traditional Liberal G. was a warm supporter of the liberating principles which his studies taught him represented the most continuous of all the streams of Eng. hist. and law. His chief works are important contributions to historical scholarship and are based on research into original documents, though his books are addressed as much to the average cultivated reader as to the specialist. They are perhaps characterised by too great a fondness for epigram, and the stylistic exuberance of the Lytton Strachey method of biography, but he had a flair for detecting, in a chaos of historical records, the salient personality and the truly significant events; and with the aid of a strong imagination could convey his view of hist. through a series of impressive

portraits and episodes handled with rare intellectual integrity. Besides the above works he wrote *The Partition of Europe, 1715-1815* (1914); *The Second Empire* (1922); *Bonnet and Shawl* (1928, essays on Victorian women); *The Queen and Mr. Gladstone, 1845-1879*, 2 vols. (1933); *The Hundred Days* (1934); *Idylls of the Queen* (1937); and *The Two Marshals*, (1943), a study of Bazaine and Pétain.

Guelderland, or Guelders, see GELDERLAND.

Guelder-rose, or Viburnum Opulus, beautiful species of Caprifoliaceæ, a marsh shrub common to N. Europe and to Britain. The petals are large, and when cultivated the flowers are neuter; because of its white ball of flowers the G. is also called the snowball tree.



GUELDER-ROSE

Guelph, surname of the Brit. royal family of the house of Hanover. It was superseded in 1917, during the First World War, by Windsor.

Guelph, co. tn of Wellington co., Ontario, Canada, on the R. Speed, 60 m. from Toronto, and 28 m. N.W. of Hamilton. Known as 'the Royal City' from its name. On Canadian National and Canadian Pacific Railways. Founded by John Galt, the Scottish author, in 1827, in the centre of a rich agric. dist.; in the same year the settlers organised the first 'agric. society' in Upper Canada, and later the city became the site of the ann. Ontario prov. winter fair. The famous Ontario Agric. College was inaugurated in 1874 and the Ontario Veterinary College later. Associated with the veterinary college is the Macdonald Institute of Economics for Women. The city has a beautiful park, twenty churches, a fine public library, and two hospitals. The manufs. include iron and steel, textiles, rubber, woodworking, carpets, felt, clothing, soap, stoves, and furnaces, and electric washing machines. Pop. 23,000.

Guelphs and Ghibellines. These names are the Italianised forms of the Ger. words *Welf* and *Waiblingen*, although one tradition says that they are derived from *Guelph* and *Gibel*, two rival brothers of *Pistoles*. Another theory derives Ghibelline from *Gibello*, a word used by the Sicilian Arabs to translate *Hohenstaufen*. A more popular story tells how, during

a fight round Weinsberg in Dec. 1140, between the Ger. king Conrad III. and Welf, count of Bavaria, a member of the powerful family to which Henry the Lion, duke of Saxony and Bavaria, belonged, the soldiers of the latter raised the cry 'Hie Welf,' to which the king's troops replied with, 'Hie Waiblingen,' this being the name of one of Conrad's castles. The rivalry between Welf and Hohenstaufen, of which family Conrad was a member, was anterior to this event, and had been for some years a prominent fact in the hist. of Swabia and Bavaria, although its introduction into Italy, in a modified form, dates from the time of the It. expeditions of the Emperor Frederick I. Chosen Ger. king in 1152, Frederick was not only nephew and heir of Conrad, he was related also to the Welfs; yet although his election abated to some extent the rivalry between Welf and Hohenstaufen in Germany, it opened it upon a larger and fiercer scale in Italy. During the period covered by Frederick's It. campaigns his enemies became known as Welfs, while his partisans seized upon the term of Waiblingen or Ghibelline, and the contest between the two parties was carried on with a ferocity unknown even to the inhab. of S. Germany. The story of the contest between Guelph and Ghibelline is nothing less than the hist. of Italy in the Middle Ages. At the opening of the thirteenth century the contest was intensified by the fight for the Ger. and imperial thrones between Philip, duke of Swabia, son of Frederick I., and the Welf, Otto of Brunswick, afterwards the Emperor Otto IV. A fight waged in Italy as well as in Germany. Then, as heir of Philip of Swabia, Frederick II. was forced to throw himself into the arms of the Ghibellines, whilst his enemies, the popes, ranged themselves definitely among the Guelphs, and soon Guelph and Ghibelline became synonymous with supporter of pope and emperor. After the death of Frederick II. in 1250, the Ghibellines looked for leadership to his son, the Ger. king, Conrad IV., and then to his natural son, Manfred, whilst the Guelphs called the Fr. prince, Charles of Anjou, to their aid. The combatants were nearing exhaustion, and after the execution of Conrad in 1268 this great struggle began to lose force and interest. Guelph and Ghibelline were soon found representing local and family, rather than papal and imperial, interests. In the fifteenth century the two names began to die out of current politics. When Louis XII. of France conquered Milan at the beginning of the sixteenth century, the old names were revived. The Fr. king's supporters were called Guelphs and the friends of the Emperor Maximilian I. were referred to as Ghibellines. The Guelph party meant the burghers of the consular coms., the men of industry and commerce, and the Ghibelline party meant the men of arms and idleness. Dante was a Ghibelline and Petrarch was a Guelph.

See bibliographies of GERMANY, History, and ITALY, History; and V. Vitale, *Dominio di Porto Guelphi in Bologna, 1280-1327*, 1901; C. Poulet, *Guelpes et*

Ghibelines, 1920; R. Piattoli, *I Ghibellini di Prato*, 1868-80, 1930-31; C. Troya, *Del velro allegorico di Dante*, 1932; G. Fasoli, *Guelfe e Ghibellini di Romagna*, 1880-81, 1936; and G. C. A. Evola, *Mistero dei Gradi e la tradizione Ghibellina dell'impero*, 1937.

Guenever, see GUINEVERE.

Guenons, see CERCOPITHECUS.

Guerande, picturesquely old Fr. tn., situated 47 m. W. by N. of Nantes in the dept. of Loire-Inférieure. It is near the sea and has a handsome medieval church. Pop. 6100.

Guereino, Il ('squint-eyed'), the nickname of Giovanni Francesco Barbieri (c. 1591-1666). It. historical painter, b. at Cento, in Ferrara. A self-taught genius, who formed his style, successively, after Caracci, Caravaggio, and Guido. His masterpiece, 'St. Petronilla' (1622) was painted for Gregory XV. and later was placed in the Capitol.

Guéret, tn. in France cap. of the dept. of Creuse, which grew up round an abbey founded in the seventh century. Pop. 10,100.

Guerillas, name given to bands of armed men who carry on an irregular warfare on their own account. They belong peculiarly to Spain, and in 1808-14 they fought against the Fr. Some joined Wellington and rendered him service, but when peace was concluded formed themselves into robber bands. Guerilla warfare was dealt with at the Hague Conference in 1899, and the rules made were reaffirmed in 1907. G. played a prominent part throughout the Second World War as well as in Ethiopia, during the It. invasion, and in the Sp. civil war. In Russia, where they were more generally known as 'partisans', they operated, despite savage reprisals, behind the advancing enemy with considerable effect, and notwithstanding hardships they were able to hold out almost indefinitely. Partisans also played an important part in N. Italy in 1943 in bringing about the final overthrow of Mussolini. Under the name of the *Maquis* G. co-operated with the Anglo-Amer. invaders in 1944 in a way which brought the warm commendations of Gen. Eisenhower (*q.v.*). In the closing stages of the Second World War and afterwards, G. of varying political parties waged a bitter intesting war until well into 1947. See further under GREECE, *History*.

Guérin, Georges Maurice de (1810-39), b. at La Cayla, Languedoc. His *Reliquie*, letters, poems, etc., were pub. in 1860, ed. by G. S. Trébutien; to this ed. appeared as preface the famous critique of Sainte-Beuve, who regarded him as a spiritual kinsman of Bernardin de Sainte-Pierre. Although not wholly devoid of a tendency to morbid sentimentalism, his writings are remarkable for their exquisite appreciation of the pagan beauty, the harmony and pathos of Nature. The best picture of G. is to be found in the *Journal* of his sister, Eugénie G. See M. Arnold, *Essays in Criticism*, 1865, and Naomi Royde Smith, *The Idol and the Shrine*, 1949.

Guérin, Pierre Narcisse, Baron (1774-

1833), Fr. historical painter, b. in Paris. He studied under Regnault. In 1799 he exhibited his 'Return of Marcus Sextus', in which he reached the highest point of his art. In 1803 he received the cross of the Legion of Honour, and in 1816 was appointed director of the Fr. school at Rome. His chief works are 'Hippolytus and Phaedra' (1802); 'The Revolt of Cairo' (1806); 'Pyrrhus and Andromache' (1810); 'Aeneas and Dido' (1817); 'Clytemnestra' (1817); 'Ulysses'; and 'Death of Marshal Lannes'.

Guernsey, second in size of the Channel Isles, lies 30 m. from the coast of Normandy. It is triangular in form, with an area of 25 sq. m., and its surface slopes from S. to N. The climate is mild and healthy, and the soil, when manured, is very fertile. The chief crops are tomatoes under glass, luxury fruits such as melons, grapes, and figs, also early vegetables and flowers, all of which are extensively exported. The is., too, produces a famous breed of cattle, renowned for the richness of the milk; also a special sort of granite almost unrivalled for paving. The chief tn. is St. Peter Port. At the end of June 1940, after the collapse of France, G. and the other Channel Is. were completely demilitarised, the troops withdrawn, and large numbers of the civilian pop. arrived in Britain, while everything of value to the enemy was removed. On the same evening Ger. aeroplanes bombed and machine-gunned the is., 23 persons being killed and number injured. Afterwards the Ger. took possession of the is. and heavily fortified it. It was liberated in 1945. At the latter end of the year a committee of the privy council, led by the home secretary, visited the is. for the purpose of considering the constitution and making recommendations that might be considered by the states of the is. with a view to bringing their ant. laws into line with modern ideas. After long and considered study the is. decided to adopt most of the suggestions. Pop. 40,300. See further under CHANNEL ISLANDS.

Guernsey Breed, see under CATTLE.

Guernsey Lily, or *Nerine Sarniensis*, Cape plant belonging to the order Amaryllidaceae. The flowers are of a delicate rose-pink, flecked with gold. It is now grown in many variations of colour.

Guerrazzi, Francesco Domenico (1804-1873), It. author, b. at Leghorn. His first pub. work was *Battaglia di Benevento* (1827), an historical novel which is remarkable for its exquisite expression; his *Assedio di Firenze* was written while he was in prison at Ponto-ferciato, 1834. This is perhaps his most important work, and tells of the downfall of the republic of Florence. In 1848 he became a minister, and in 1849, when the grand duke of Tuscany fled, he was proclaimed member of the provisional gov., and subsequently dictator. After the restoration, however, he was banished to Corsica. His other works are *Isabella Orsini* (1845); *Apologia*; his *defence* (1852); and *Beatrice Cenci* (1854).

Guerrero, coast state of Mexico, between the R. de las Balizas-Mexcala and the

Pacific. It is very mountainous, and has great mining potentialities, the minerals found here being silver, gold, mercury, lead, iron, coal, sulphur, and precious stones. The agric. products are cotton, coffee, tobacco, and cacaos. Cap. Chilpancingo; chief port Acapulco. Pop. 732,900.

Guesclin, Bertrand du (c. 1320-80), constable of France, b. in Brittany. He was of a persistent and turbulent character, and was renowned for his prowess even when a boy. He fought for Charles de Blois at Vannes in 1342, when he was contesting for the dukedom of Brittany, and

de l'homme, he was sentenced to five years' imprisonment, which he avoided by going abroad. When he returned to France under amnesty in 1376 he was a Marxian Socialist. He founded *Égalité*—the first collectivist paper to appear in France. The International Socialist Congress at Amsterdam, 1904, resolved, at G.'s instance, that Socialists must not participate in a capitalist gov. But G. himself—usually in the Chamber from 1893—joined the Viviani Cabinet on the outbreak of the First World War, and remained a member (without portfolio) till Oct. 1915.



E.N.A.

ST. PETER PORT, GUERNSEY

distinguished himself against the Eng. at Rennes, 1356, and Dinan, 1357. In 1359 he took Molin and freed the Scire from the Eng., and in 1364 won the battle of Cocherel against Charles the Bad, but was taken prisoner by Sir John Chandos at Auray. On being released he fought against Pedro the Cruel, but was defeated and taken prisoner by the Black Prince, 1367. Being ransomed he defeated and captured Pedro in 1369, and in 1370 was made constable of France by Charles V., with the result that in a few years nearly all the Eng. possessions were in the hands of the Fr. See E. V. Stoddard, 1897.

Guesde, Jules (really Mathieu Basile Guesde) (1845-1922), Fr. Socialist leader, b. in Paris. At first an official in the Ministry of the Interior (1863). For a series of articles in his paper, *Les Droits*

Guest, Lady Charlotte, afterwards Schrieber (1812-95), daughter of the ninth earl of Lindsay, was famous as a collector of fans and china. She presented some fine china and earthenware to the S. Kensington Museum. She pub. sev. vols. containing pictures of her most notable fans and the playing cards of all nations, as well as sev. old Welsh MSS., one of which, *Mabinogion*, was pub. in 1849.

Guest, Edwin (1800-80), Eng. historical writer, b. at King's Norton, Worcestershire. He was educated at King Edward VI.'s Grammar School, Birmingham, and Caius College, Cambridge, and was made a fellow of Caius in 1824. His first pub. work was the *History of English Rhymes*, in 1838, the second ed. of which appeared in 1882 ed. by Prof. Skeat. G. was practically the founder of the Philological

Society, and was secretary in 1842. His writings are of great value in the study of Rom.-Brit. hist. and include 'On Julius Caesar's Invasion of Britain' (*Archæological Journal*, vol. xxi.) and 'The Campaign of Aulus Plautius in Britain' (*Archæological Journal*, vol. xxiii.), etc.

Gueux, Les, or The Beggars, name assumed by the malcontents who opposed the introduction of the Inquisition into the Netherlands. They formed themselves into an association in 1565 and presented a petition to the regent, Margaret of Parma, 1566. The regent being at first afraid, one of her councillors asked her what she had to fear from 'beggars' (gueux). The word was remembered and the party adopted it. They maintained a vigorous warfare against Philip II. for some time, but were finally suppressed by the duke of Alva. 'The Beggars of the Sea,' under Count de la March, did much damage to the Sp. fleet and captured Briel in 1572, a victory which ultimately resulted in the independence of the Netherlands in 1648.

Guevara, Antonio de (c. 1490–1545), Sp. theologian and historian, b. at Viscaya. His early years were passed at the court of Isabella, but in 1528 he entered the Franciscan order and subsequently became historiographer and court-preacher to Charles V. In 1529 he pub. his *Dial for Princes*, a didactic novel professing to be a life of Marcus Aurelius. This work has been trans. into Lat., It., Fr., and Eng., and reprinted sev. times in Sp. He also wrote *Lives of the Ten Caesars* (1539) and *The Golden Letters* (1539–45)—the latter has also been trans. into all the principal languages of Europe. G. had considerable influence upon the Sp. prose of the sixteenth century, and his bombastic style may be compared with the euphuism of Llyl, who may have taken G. as his model.

Guevara, Luis Vélez de (1570–1644), Sp. dramatist and novelist, b. at Ecija in Andalusia. He practised as an advocate for some years, but came under the notice of Philip IV. and was appointed court chamberlain. He wrote a great number of plays, of which *Reinar despues de morir*, *Mas pesa el rey que la sangre*, *La Linda de la Sierra* are the best; but he is chiefly famous for his fantastic novel, *El Diablo cojuelo* (The Limping Devil), (1641) which is the basis of Le Sage's *Diable Boiteux*.

Guglielmi, Pietro (1727–1804), It. musical composer, b. at Massa Carrara. He studied under Durante and produced his first operatic work at Turin in 1755. In 1762 he went to Dresden to conduct the opera there, and some years afterwards appeared in London. In 1793 he became musical director at the Vatican. He was a writer of operas, both comic and serious, as well as of oratorios and orchestral pieces. His best operas are *La Didone*; *Enea e Lavinia* (1785); *I Due Gemelli* (1789); *La Pastorella nobile*; and *La Bella Pescatrice* (1789).

Guiana, see BRITISH GUIANA; DUTCH GUIANA; FRENCH GUIANA.

Guibert of Nogent (1053–1124), historian and theologian, b. at Clermont-en-Beauvoisis. In 1104 he was chosen head

of the abbey of Nôtre Dame de Nogent-sous-Coucy. His autobiography (Eng. trans. by C. Swinton, 1926) contains some very fine pictures of the customs of his day. He also wrote a hist. of the first crusade, *Gesta Dei per Francos* (ed. by H. Hagenmayer, 1890).

Guicciardini, Francesco (1483–1540), celebrated It. historian and statesman, b. at Florence of a noble and illustrious family. Educated at the univs. of Ferrara and Padua. He wished to follow an eccles. career, but his father checked the ambition, declaring that the church was too corrupt to receive any of his sons. The youth then turned his attention to law, and at twenty-three was appointed to read the Institutes in public. Soon after he became betrothed to the daughter of Alamanno Salvati. He was entrusted with an embassy to the court of Ferdinand the Catholic. Thus he entered upon the real work of his life as a diplomat and a statesman. He was ambitious, a time-server, and a place seeker. In 1515 Leo X. took him into service and made him governor of Reggio and Modena. In 1521 Parma was added to his rule; and in 1523 he was appointed vice-regent of Romagna by Clement VII. These rendered him virtual master of the papal states beyond the Apennines. In 1526 Clement gave him still higher rank as lieutenant-general of the papal army. In 1531 he was advanced to the governorship of Bologna. After the murder of Duke Alessandro in 1537, he espoused the cause of Cosimo de' Medici, who, displaying the genius of his family for politics, disengaged him, and he retired in disgrace to his villa, where he spent his last years in the composition of the *Storia d'Italia*. See A. Rossi, *Francesco Guicciardini e il governo Florentino*, 1896–99, and V. Luciani, *Francesco Guicciardini and his European Reputation*, 1936.

Guicciowar, see GAEKWAR.

Guide-books have not long been in existence. The first were Ebel's *Anleitung for Switzerland*, 1793; Boyce's *Belgian Traveller*, 1815, and Mrs. Mariane Starke's *Directions for Travellers in Italy*, 1820; but the most famous writer of a guide-book is Wordsworth, whose *Guide to the English Lakes* was pub. in 1822. In 1836 Murray pub. his handbook for Holland, Belgium, and N. Germany, and this was followed by Baedeker's Ger. guide to Holland and Belgium. Baedeker's G. are pub. in many languages. Other notable G. are those of Yoanne, for France, Gsell Fels, for Italy, Tousberg for Norway, as well as those pub. by A. and C. Black, Ward, Lock & Co. (Illustrated Guide Books), Stanford (Tourists' Guides), Macmillan (Highways and Byways), Adams (Bradshaw's Illustrated Handbooks), and Mudhead's (Blue Guides).

Guides, regiment of the Indian Army recruited mostly from Sikhs and Pathans with Brit. officers. Trained for int. warfare on the N.W. frontier of India.

Guides, Girl, see GIRL GUIDES.

Guidi, Carlo Alessandro (1650–1712), It. poet, b. at Pavia. He is important as being the chief founder of the academy

called L'Arcadia. He is essentially a lyric poet, his songs being written with singular force and charm. The most beautiful perhaps is *Alla Fortuna*. He also wrote *Amalasunta in Italy* (1681) a lyric tragedy, and *Daphne and Endymion* (1681), two pastoral dramas.

Guidi, or Guido, Tomaso di Giovanni di, see MASACCIO.

Guido d'Arezzo, or Guido Aretinus (c. 990-1050), musician of the eleventh century. He was a monk in the Benedictine monastery of Pomposa, where he taught singing; he is, rather doubtfully, credited with the invention of the musical stave, the use of which he certainly encouraged. He introduced the names ut, re, mi, fa, sol, la for the first six notes of the scale, adopting them from a hymn in honour of St. John the Baptist. He is also said to have introduced the F clef. His doctrines are explained in *Micrologus* and *Antiphonarium*.

Guidonian Syllables, see ARETINIAN SYLLABLES.

Guido Reni, commonly called **Guido** (1575-1642), It. painter, b. at Calenzano, near Bologna. He studied under Denis Calvaert, but afterwards entered the studio of the Carracci, one of whom he accompanied to Rome. Here he came under the influence of Caravaggio, and also began to study the works of Raphael, and soon afterwards painted 'Aurora preceding the Chariot of Apollo,' which is usually considered his greatest work. He also painted 'St. Cecilia'; 'The Crucifixion of St. Peter'; 'St. Michael'; and 'Aladine and Fortune' while in Rome. He spent some time in Naples in 1621, and began his famous picture the 'Nativity,' and also visited Bologna and the other ins. of N. Italy. As a painter he is remarkable for the purity of his colouring and his dramatic force, while as an engraver he was bold and free in execution; and his works in this direction are as graceful as his paintings. It was only in his later years that his work declined, and this was owing to rapidity of execution.

Guienne, or Guyenne, largest of the anc. provs. of France, which in the twelfth century formed with Gascony the duchy of Aquitaine. It came into the hands of the Eng. when Henry II. married Eleanor of Aquitaine, but was finally united to France by Charles VII. in 1451.

Guildford, municipal bor. and cap. of Surrey, England, 30 m. S.W. of London, reached by two branches of the railway. It is situated in a beautiful rural area on the R. Wey in a gap in the N. Downs, bounded to the W. by the Hog's Back and to the E. by the Merrow and Dorking Downs. Its growth as an urban and market centre has endowed it with many fine buildings, the most important being the Edward VI. or Royal Grammar School, the magnificent Tudor Hospital of the Blessed Trinity, founded by George Abbot, archbishop of Canterbury, in 1619, and the fine seventeenth-century guildhall with its projecting clock. An inscription over the gate attributes the foundation of the Royal Grammar School to Edward VI., in 1552, but the real

founder was Robert Beckingham (d. 1528), though Edward VI. augmented its endowment, and the present building was begun about 1557. There was a guildhall in the time of Edward III., probably on the site of the present building. This latter was considerably enlarged in 1588. In the hall, which is used as a court room, are pictures of Charles II. and James II. by Lely, and of William III. and Mary II. attributed to Riley. The bronze standard corn measures were presented by Queen Elizabeth. In the old oak-panelled council chamber is an excellent portrait of James I. by Paul van Somer, a portrait of Vice-Adm. Sir Richard Onslow receiving the Dutch flag after the battle of Camperdown, by John Russell, R.A., the G. artist, and many other pictures of well-known men. The tn. is dominated by the ruined Norman keep, which dates from the twelfth century and was once part of a private royal residence. The oldest church, St. Mary's, dates from Saxon times and contains some medieval wall paintings. Gradually enlarged in successive periods, it completely surrounds the slender tower, which dates from an earlier period, probably as far back as the time of Edward the Confessor. G. cathedral, in course of erection, is only the third entirely new Anglican cathedral to be built in England since the Reformation. In 1927 Winchester diocese was found to be too large for administration as one unit, and was therefore divided into three—Winchester, Portsmouth, and G.—and since that year the church of the Holy Trinity has served as the pro-cathedral pending the building of the cathedral, the foundation stone of which was laid by the archbishop of Canterbury on July 22, 1936. The cathedral, designed by Edward Maufe, is on a magnificent site on Stag Hill, given by the earl of Onslow. The internal length from the W. doors to the E. end of the Lady Chapel will be 365 ft., height of vaulting, 68 ft., tower, 157 ft. high, seating capacity, 2000. A church has stood on the site of the Holy Trinity pro-cathedral church since the twelfth century, but in 1740 the old tower fell, necessitating rebuilding. In the S. chapel is the tomb of Archbishop Abbot, which survived the calamity of 1740. Its clock has an unusual set of chimes, varying each quarter of an hour. Other churches are St. Nicholas on the W. of the riv. crossing, built in 1875, and St. Martha's on a hill which was known as Martyrhill so named from the tradition that early Christian martyrs suffered there, but the church is dedicated to St. Martha.

The origin of the name G. is not certainly known. Some relate it to the 'guild' and the 'ford' over the riv., but it is more likely that the name was derived from the riv., which is said to have been called Gill or Guiou, or Wiley as it was called in A.-S. times. A very anc. name for the place was Astolat, famous in Arthurian romance. The first certain information is in the will of Alfred the Great, A.D. 900, when he bequeathed the

tn. to his nephew Ethelred, on whose death or rebellion it reverted to the Crown. From 978 G. was the seat of the royal mint and coins struck here in A.-S. times still exist. Long before the erection of G. castle the A.-S. kings constantly visited the tn. A keep was built towards the eleventh century and in Norman days a succession of the Plantagenet kings resided there. Henry III., who visited G. over a hundred times between 1216 and 1272, granted the tn. the right to have its own bor. magistrates. The earliest reference to the Dominican friary of G. is in 1268, when it was founded by Queen

part played by the G. wool staplers and cloth workers in the hist. of the tn. The sixteenth and seventeenth centuries were connected with the three brothers Abbot, inhab. of the tn., the children of a humble clothworker. George Abbot (mentioned above), the chief of the three, rose to be archbishop of Canterbury in 1611; Robert became bishop of Salisbury, and Maurice lord mayor of London; all three were pupils of the G. Grammar School. The (c.) corporation has had a continuous existence from the time of the mayor of 1413 to the present day. It has maintained a considerable amount of state,



THE RIVER WEY AT GUILDFORD
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Eleanor. It was in this friary that Prince Henry, son of Edward I. and Eleanor and heir to the throne, d. (1274). The name survives in Friary Street. In its time the friary was an important place with a library containing many books and MSS. In 1538 it surrendered to Henry VIII's commissioners for the dissolution of the smaller monastic houses. The earliest known charter of G. was dated 1256 and its charter of incorporation dates from 1283. The first mention of a member of Parliament is in Edward I.'s reign in 1291. A mayor is alluded to in 1377 following the last of the seneschals who formerly governed G. There were other charters in 1256 and 1341 giving G. the power of holding assizes, freedom from toll, and an ann. fair. In 1489 a charter from Henry VII. reaffirmed the earlier charters. The elaborate coat of arms of G., granted in 1465, commemorates the

using not only its very early mace but a very fine one presented in 1663 and a superb gold chain of office given by the high steward in 1673. The aldermen's privilege of wearing the royal scarlet dates from the grant by James II. in 1686. The loss of one member of Parliament came in 1868 and of the second in 1885, so that G. lost (until 1918) the privilege of sending its own member to Parliament. Pop. 47,000. See G. Williamson, *Guildford in the Olden Time*, 1904.

Guildhall, important public building of London, the place of assembly for various courts (court of common council, court of aldermen, chamberlain's court). Originally begun in 1411, the building was partly destroyed by the fire of 1666, receiving its later form in 1789, with George Dance for architect. It has an auct. crypt (see W. J. Loftie, *London City*,

1891). It is famous for civic concourses and banquets, being first used for this purpose in 1500, when Sir J. Shaw gave the lord mayor's feast (see F. G. H. Price, *Guildhall*, 1886). The great hall of the lord mayors of London was burned in the Ger. fire-raid of Dec. 29, 1940. The famous library of the G. was damaged, but less seriously than the hall; the art gallery was undamaged. Some fifteen fire-bombs which fell on the G. had been dealt with promptly by the A.R.P. staff, but sparks from the locked and unattended church of St. Lawrence Jewry were carried to the G. roof, doing most of the serious damage. Many valuable pictures and other articles had, however, previously been removed. In a general sense G. is the hall where guilds and corporations usually meet, corresponding to a tn. hall.

Guilds, or Gilds. The origin of G. which played so important a part in medieval city life, dates back to very early times, when small family groups, united solely by kinship, became merged in larger communities. We find among the A.-S. 'frith-gilda' associations of freemen for mutual aid. London had a union of such societies, with the 'kings' 'htengild' at their head, and there were 'Thane-gilda' at Cambridge and Canterbury. Even before the Norman Conquest the lithsmen or shippers' gild of London had considerable importance, but religious and merchant G. only came into prominence later, as trade and wealth increased. The former often undertook a good deal of secular work, acting as benevolent and insurance societies, and sometimes providing roads, bridges, and schools. The *gilda mercatoria* became in many instances so important that some historians have asserted that the 'gild merchant' formed practically the municipal gov., but this does not seem to be correct. Burgesses might or might not be gildsmen, and the gild did not govern the bor. But each controlled its own trade, having within its proper area a monopoly granted by charter. In time the craftsmen grew jealous of the traders and formed G. of their own, master-craftsmen often belonging to both fraternities. As early as 1180, under Henry II., eighteen such G. were fined for having been formed without special permission. Merchant G., especially in the larger cities, gradually found themselves supplanted by the new order, and by the end of the fourteenth century the craft G. were victorious. They were as great monopolists as their predecessors, every 'misterio' being a close corporation, with very strict rules against competition, and also as to the hours of labour and the amount and quality of the work. These mysteries held charters from the gov., and were assigned distinctive livery; from them are descended the livery companies of to-day. Before long the craft G. themselves subdivided, the journeymen setting up companies of their own to contest the question of hours, wages, etc., with their masters, thus becoming the forerunners of modern trade unions. The contest was much fiercer in Germany than in England, as the merchants there had

organised themselves on very autocratic lines, and the struggle was not merely for improvement of labour conditions, but for general liberty. Most craft G. had religious associations, each having its own chapel and patron saint. In England these were abolished under Edward VI. See also COMPANIES, LIVERY. See J. Smith, *English Gilds*, 1870; L. Brentano, *Die Arbeitervilden der Gegenwart*, 1870; W. J. Lofft, *London*, 1887; C. Gross, *The Gild Merchant*, 1897; G. Unwin, *The Gilds and Companies of London*, 1908; and S. Kramer, *English Craft Guilds*, 1927.

Guild Socialism. Brit. variant of syndicalism (q.v.). The movement was begun in 1906 under Hobson and Penty to bring about the restoration of the medieval guild system on modern lines. The trade unions were to be organised as guilds to control their respective industries after they were nationalised. In 1915 the National Guilds League was formed and many trade unions joined it. Five years later the National Guild Council was formed and a building guild was organised to carry out an ambitious plan, formulated by the council to erect houses. The collapse of this scheme ended the league, which was dissolved in 1925. See G. D. H. Cole, *Guild Socialism Restated*, 1927.

Guilford, Earl of, see NORTH, FRANCIS.

Guillaumat, Adolph (1863-1940), Fr. general, b. at Bourgneuf. Pupil at St. Cyr, 1882-84. Rose to colonel by 1900; in that year wounded in Boxer rebellion, Tientsin. Prof. St. Cyr 1903; at school of war, 1906. Director of infantry, 1912. Brigadier-general, 1913. Commanded 33rd Div., 1914, Marne and Argonne; general First Army Corps, 1915, Verdun and Sonne; Second Army, Verdun, front position Aug. 20, 1917. Superseded Gen. Sarrail, chief of allied armies of Orient, Salonika, 1917; governor of Paris when besieged, July 1918; commanded Fifth Army on Alsace in Oct. Member Superior Council of War, 1919. Commander of Rhineland army from 1924. Minister of war 1926.



“JILLEMOT”

Guillemots (gull and mew), genus of diving birds of the auk family (Alcidae), and the genera *Cephus* and *Uria*. There are about eight species in the Arctic and

N. temperate zones. The common or "foolish" guillemot (*Uria lutea*) breeds in Britain. The bill is long and straight, the wings and tail short, the feet three-toed and webbed, the legs being placed very far back. In colour G. are mostly brownish-black on top and white underneath. The dark throat becomes white or mottled in winter. They build no nests, but breed on rocky coasts. One pear-shaped egg is laid at a time. They are numerous round Flamborough Head (Yorkshire), the eggs being sought after chiefly for their albumen, which is used to clarify wine and in the preparation of patent leather. The black guillemot (*Cephus grylle*) is less common but found in N. Scotland, and is smaller. A third Brit. species (*U. Bruennichi*) is rare.

Guillim, John (c. 1565–1621), Eng. heraldic official, educated at Oxford. He was Rouge Croix pursuivant at the College of Arms for most of his life. He was editor of *A Display of Heraldrie* (1610) (reprinted 1724), from Dean Barkham's collections, according to Dugdale and Wood (seventeenth century). Ballard, Bliss, and Moule think it was chiefly G.'s own work. See Fuller's *Worthies*, 1682; J. Duncumb, *Herefordshire*, 1904–12; A. Wood, *Athenae Oxoniensis* (ed. by A. Bliss, 1813–20), II.; and T. Moule, *Biblioteca Heraldica: Notes and Queries* (2nd series), vi.–viii.

Guillotine, instrument for inflicting capital punishment, introduced into France at the time of the revolution. It consists of two upright posts surmounted by a cross-beam and grooved so as to guide an oblique-edged knife, the back of which is heavily weighted to make it fall swiftly and with force, when the cord by which it is held aloft is let go. Some say that the machine was invented by the Persians, and previous to the time when it became known by its present name it was used in Scotland, England, and various parts of the Continent. In a museum in Edinburgh there is still preserved the "Maiden," as it is called. Until 1650 there existed in the forest of Hardwick, in England, a mode of trial and execution called the gibbet law, by which a felon convicted of theft within the liberty was sentenced to be decapitated by a machine called the Halifax gibbet. In Germany the machine was in general use during the Middle Ages under the name of the Diele, the Hobel, or the Dolabea. From the thirteenth century it was used in Italy, under the name of Mannala, for the execution of criminals of noble birth. Dr. Guillotin, who first suggested its use in modern times, was b. at Saintes in 1738. In 1789 he brought forward two propositions regarding capital punishment, one being that it should be by means of a machine and the other that all, gentle and simple, who were sentenced should be executed in the same way, as swiftly and painlessly as possible. The idea was adopted on Oct. 6, 1791. A Ger. named Schmidt furnished a machine for each of the depts. in France. Experiments were first made with dead bodies from hospitals. A highwayman was the first

to be thus executed; this was in 1792. Some doubt seems to have at first existed as to whether death was instantaneous, and the case of Charlotte Corday was instanced in support of the theory that it is not. See A. Chereau, *Guillotine et la guillotine*, 1871.

Guimarães, anct. fort. tn. of Portugal, in the prov. of Minho. It is picturesquely situated on the R. Ave and possesses hot sulphurous springs. Knives, leather, paper, etc., are manufactured, and table linen is woven. The tn. is famous for its embroidery. Pop. (1940) 12,968.

Guinea, former gold current coin of Great Britain, first struck in Charles II.'s reign (1664), and so called because originally made from gold obtained from the G. Coast. "Spade Gs." were those which had a spade-shaped shield on the reverse with the royal arms. It was the chief Eng. gold coin, till replaced by the sovereign in 1817. Its value varied considerably from 30s. in 1695 to 21s. in 1717—the value now understood by the word, though no current coin of the name still exists. Professional fees, subscriptions, prices of pictures, etc., are often estimated in Gs.

Guinea, large section of the W. coast of Africa, generally considered to extend from the mouth of the Senegal to Cape Negro. The name came into general use in the fifteenth century. It is divided into two parts, Upper G. and Lower G., and comprises many states and political tiers., viz. Senegal (a Fr. colony), the Eng. settlements on the Gambia; Birrajos (Portuguese ter.); Sierra Leone (Brit.); the Ivory and Gold Coasts (Fr. and Brit.); the Slave Coast (Fr. and Brit.); the Brit. Protectorate of S. Nigeria, etc. etc. The coast-line is uniform and flat, interspersed with shallow lagoons. Inland the country rises to the central plateau of Africa, and the rvs. are usually precipitated in cataracts and rapids. The coast is hard of access from the sea, owing to the dearth of good havens and the roughness of the surface. The climate of G. is very unhealthy, if not deadly. The Portuguese were the first to explore and trade along the coast, tempted by the gold deposits and later by the opportunities of slave-trading.

Guinea, French, see FRENCH GUINEA.

Guinea, Gulf of, gulf of the Atlantic Ocean on the W. coast of Africa, between Capes Palmas and Lopez. On the N. and E. are two open bays—the bights of Benin and of Biafra—separated by the delta of the Quorra or Niger. The gulf contains the is. of Fernando Po, Prince's (Príncipe) Is., St. Thomas (São Thomé), and Annobon. It receives the counter-equatorial current crossing the Atlantic near the equator, and sends out the equatorial current which flows in the opposite direction, finally giving rise to the Gulf Stream.

Guinea-fowl (*Numida*), genus of African birds of the pheasant family (Phasianidae). There are about a dozen different species in the Ethiopian region, extending E. to Madagascar and S. to Natal. They are now naturalised and domesticated in most

countries, but prefer a warm climate. Gs. are inclined to be quarrelsome in a poultry yard, but are much valued for their flesh and eggs, which command high prices. The common pintado (*Numida meleagris*), sometimes called 'Come-back' from its frequent harsh cry (probably the *Meleagris* or *Gallina Numidica* of the Romans), has dark-grey plumage with round white spots, a horny 'casque' on the head, and fleshy wattles on the cheeks. Other species are the *Guttera cristata* of W. Africa and the *Phasianus niger* of equatorial W. Africa (very rare), the males having spurs like pheasants. The birds are mostly gregarious and ground-feeders, but roost in trees. They were probably reintroduced to Europe by the Portuguese explorers of Africa in the sixteenth century. See C. Gesner, *Paralipomena*, 1555, and C. Darwin, *Animals and Plants under Domestication*, 1873.

Guinea-grass, or *Panicum maximum*, species of Gramineae in the same genus as the millets. It is a perennial plant growing in a tropical climate, and is used as a fodder plant.

Guinea Pepper, or **Bell Pepper**, name given to the seeds or dried fruit of several plants of W. Africa, such as the *Capsicum grossum*, *c. frutescens*, *Piper Clusi*, and *Xylophia Althiopica*. Malagueta (Malaghetta) pepper and Ethiopian pepper are often considered equivalent to G. P. It was much used as a vegetable and for pickling in the E. (still replaced by E. peppers in the eighteenth century), and the trade in it resulted in the settlements of Grand Bassa and Cape Palmas. See CARSIKUM; TEBBS.

Guinea-pig, or **Cavy** (*Cavia*), genus of small rodents native to S. America, but now domesticated in most countries. Sometimes considered as a separate species (*Cavia cobaya*), the familiar common cavy is probably a domesticated form of the *C. aperea* of Guiana and Brazil, introduced by the Dutch into Europe in the sixteenth century. The domesticated kinds are mostly white, or marked with yellow and black, or tawny-coloured. They have short limbs, the fore-feet having four toes, the hind feet only three. Their ears are short and rounded and they have no tails. Gs. are very prolific, producing young five or six times a year. They are much used in bacteriological laboratories for the study of germ diseases.

Guinea-worm, found as a parasite in the tropics under the human skin, especially of the legs. The worms are the thickness of horse hairs, and measure from one or two to six feet in length. The eggs enter the stomach in drinking-water. The G. is said to be the 'fiery serpent' of Mosaic hist.

Guinegate, vil. of arron, Saint-Omer, dept. Pas-de-Calais, France. The site of two important battles: (1) In 1479, when the Austrians defeated the Fr. and (2) In 1513 (Aug. 16), when the Eng., under Henry VIII., and the Imperialists, under Maximilian I., put the Fr. to flight so precipitately that the battle was called the 'battle of Spurs.'

Güines: 1. City of Havana prov., Cuba,

on R. Mayabecque, 34 m. S.E. of Havana. The tn. is flourishing, with many modern institutions, and stands in a fertile plain. Pop. 22,600. 2. Tn. of arron, Boulogne, dept. Pas-de-Calais, France, 7 m. S. of Calais. Near this tn., in 1520, Francis I. of France and Henry VIII. of England met on the Field of the Cloth of Gold. Pop. 4200.

Guinevere, **Guinever**, or **Guenever**, corrupt form of Guanhuma (Welsh *Gwen-hwysar*), anct. Brit. queen, daughter of King Leodograunce of Camelopard, and wife of King Arthur. She was the most beautiful of women and cherished a guilty love for Sir Launcelot of the Lake, one of the Knights of the Round Table. According to Geoffroy's *History of Britain*, during King Arthur's absence against Leo, king of Rome, she married his nephew Modred, who had usurped the kingdom left in his charge by Arthur. Arthur returned and defeated Modred at Camblia, a battle fatal to both leaders, while G. fled from York to the nunnery of Julius the Martyr at Newport in S. Wales. According to Malory, Arthur had gone to Brittany to punish Launcelot when Modred usurped the kingdom and attempted to marry G. She, however, shut herself up in the Tower of London, and on hearing of Arthur's death went into a nunnery at Almesbury. Tennyson, in the *Idylls of the King*, makes Modred discover the relationship between G. and Launcelot. The latter flung Modred to the ground and took to horse, while the queen fled to Almesbury where Arthur came to take leave of her.

Guingamp, cap. of arron, in the dept. of Côtes-du-Nord, France, on the R. Trieux, 52 m. W. of St. Malo. From the fourteenth to the seventeenth century it was the cap. of the duchy of Penthièvre. The medieval church of Notre Dame de Bon Secours is a great resort of pilgrims. Pop. 8600.

Guinicelli, Guido (c. 1230-76), lt. poet, b. in Bologna, where he studied and practised law. In 1274 he was exiled as one of the Ghibelline Lambertazzi party, and d. in exile. Only seven canzoni and five sonnets by him are extant, the best known being the canzone, *The Gentle Heart* (trans. by G. D. Rossetti), which is praised by Dante. They are printed in a collection pub. at Florence by Nanucci in 1813.

Guinness, Arthur Edward, see ARDILAUN, BARON.

Guinness: 1. *Arthur* (d. 1855), brewer; head of the firm of Arthur G. & Sons, of Dublin. He married Anne, daughter of Benjamin Lee. 2. *Sir Benjamin Lee* (1798-1868), third son of the above, b. in Dublin and succeeded his father as head of the firm, which he managed with the greatest success. In 1851 he became first lord mayor of Dublin, and during 1860-65 restored St. Patrick's Cathedral at a cost of £150,000. In 1863 he was made an LL.D. of Dublin Univ.; in 1865 was elected M.P. for the city in the Conservative interest, and in 1867 was created a baronet. 3. *Sir Arthur Edward* (1840-1915), eldest son of the above, succeeded

to the baronetcy, and in 1880 was created Lord Ardilann. 4. *Edward Cecil* (1847-1927), third son of Benjamin Lee, was created a baronet in 1885, Baron Iveagh in 1891, and Viscount Iveagh in 1905. See also *IVEAGH, EARL OF*.

Guinobatan, tn. and com. in Albay prov., Luzon, Philippine Is. It is situated on the R. Inaya, and hemp is extensively cultivated. Pop. 26,700.

Gipuzcoa, maritime prov. of N. Spain, situated on the bay of Biscay, with an area of 728 sq. m. There are numerous mineral springs—salt, sulphurous, and ferruginous—which are greatly frequented by visitors. Zinc is found in the prov. The industries are carpets, glass, paper, chemicals, soap, cannon, etc. San Sebastian is the cap. Pop. 352,300.

Guiraud, Ernest (1837-92), composer, b. at New Orleans, of Fr. parentage; studied at Paris and Rome. He served in the Franco-Ger. war (1870-71), and in 1876 became prof. of harmony and accompaniment at the Conservatoire. His operas include *Le Roi David* (1852); *Sylvie* (1864); *En Prison* (1869); *Le Kobold* (1870); *Mme Turlupin* (1872); *Gretna Green* (1873); *Piccolino* (1876); *Le Galante Aventure* (1882); *Gli avventurieri*, and *Brunhilde* (ed. and produced posthumously). He also wrote sev. cantatas, overtures, etc.

Guiraut de Bornell (c. 1138-c. 1220), Provençal troubadour, b. at Excideuil (modern Dordogne), and accompanied Richard I. of England to the third crusade. About eighty love poems by him, written to a lady of Gascony, are extant, and are distinguished by simplicity and directness. He was known as 'Master of the troubadours,' and is mentioned in Dante's *Divina Commedia*. Some of his poems were ed. by Kolsen in 1894, but no complete ed. exists.

Guisborough, m.rkt. tn. of N. Riding, Yorkshire, England, situated in the valley of Cleveland, 9 m. E.S.E. of Middlesbrough. Iron is largely obtained in the neighbourhood, and there are breweries and tanyards. There is a sulphurous spring in the vicinity. Pop. 8000.

Guisard, or **Wiscard**, Robert (1015-1085), first Norman duke of Apulia and Calabria, b. near Coutances, Normandy; the son of Tancred de Hauteville. He went to Italy as a pilgrim, and raised a band of adventurers to fight the Gks. and Calabrians. He was soon joined by many Normans and was very successful. In 1060 he captured Reggio and Cozenza, and accordingly obtained from Nicholas II. the investiture of Apulia and Calabria. He and his brother Roger were the papal champions in S. Italy and Sicily against the Gks. and Saracens. In 1081 he invaded the Byzantine Empire and defeated the emperor, Alexius Comnenus, at Durazzo. He hurriedly returned to Italy to protect the pope, Gregory VIII., from the Emperor Henry IV., and later went back to the E., dying in Cophalonia.

Guise, or **Guyse**, Dukes of, ducal family of Lorraine, France, named from the tn. of G. (q.v.). *Claude of Lorraine* (1496-1550), the first duke, b. at the Château

de Condé, being the fifth son of René II., duke of Lorraine. He became a Fr. citizen; married Antoinette de Bourbon about 1514; joined the army and fought at Marignano (1515), and was created duke of G. by Francis I. for suppressing the peasant revolt in Lorraine in 1527. *Francis of Lorraine* (1519-63), the second duke, was the son of Claude, and became a great military commander and leader of the Catholics. In 1552-53 he defended Metz against Charles V. of Germany; in 1554 fought at Renti, and in 1556 commanded the expedition against Naples. In 1557 Henry II. made him lieutenant-general of the kingdom, and in 1558 he took Calais from the Eng. and brought about the treaty of Cateau-Cambrésis in 1559. He and his brother Charles, cardinal of Lorraine, were active in suppressing the Protestants, and defeated the conspiracy of Amboise, taking its leader, the duke of Condé, captive at Dreux in 1562. He was assassinated by a Huguenot at the siege of Orléans. He left valuable memoirs. *Henry of Lorraine* (1556-88) (Balafré), the third duke, was the son of Francis, and succeeded him as an opponent of Protestantism. He fought at Poitiers, Jarnac, Moncontour (1569), and Dormans, was concerned in the massacre of St. Bartholomew (1572) and in the murder of Coligny. In 1576 he became head of the Catholic League. Becoming too ambitious, he was assassinated at Blois by the order of Henry III. *Charles IV. of Lorraine* (1571-1640), fourth duke, was imprisoned at Tours on the assassination of his father, Henry, in 1588. He escaped in 1591 and entered the service of Henry IV., gaining a victory at Marsciellos in 1596. He was banished by Richelieu in 1631. *Henry II. of Lorraine* (1614-64), fifth duke and prince of Joinville, b. at Blois, son of Charles IV. In 1629 he became archbishop of Rheims and in 1640 succeeded to the dukedom. In 1641 he joined the conspiracy of the count de Soissons against Richelieu and was condemned to death, but escaped to Flanders. In 1647 he joined the Neapolitan revolt of Massaniello against Spain, but was taken as a prisoner to Madrid. He escaped in 1652, again attempted to win Naples in 1654, and became high chamberlain of France in 1655. The ducal line became extinct at the death of *Francis Joseph of Lorraine* (1670-75), the seventh duke.

Guise, Mary of, see **MARY**.

Guisley, par. and vill. of W. Riding, Yorkshire, England, 2 m. S.W. of Otley. Tweeds and other woollen goods are manufactured. Numerous anct. stone coffins have been discovered. Pop. 6000.

Guise, tn. of arron. Vervins, in the dept. of Aisne, France, on the R. Oise, 18 m. N.E. of St. Quentin. It has important ironworks and manufs. textiles, and contains a communistic labour colony. It was fortified in the eleventh century and has stood many sieges. It gives its name to the duchy of G., founded 1528. Considerable damage was done to the tn. during the First World War. Pop. 7100.

Guitar (Sp. *guitarra*), stringed musical instrument. It has a flat soundboard made of pine, with a large sound-hole; a

flat back, made of maple, ash, or cherry-wood, and joined to the soundboard by ribs and curving sides. There are six strings, three of gut and three of wire-covered silk, which extend from the bridge, which is of ebony, to the end of the finger-board, from which the head is bent back at an obtuse angle. The strings are tuned to the notes E, A, D, G, B, E, in the treble clef, but they are produced an octave lower than written. The instrument is played by plucking at the strings with the thumb and three fingers of the right hand, while the fingers of the left hand press the strings to regulate the intervals.

Guity, Lucien-Germain (1860–1925), Fr. actor, b. in Paris. First appearance, 1878. Married in London, 1882. Spent nine years in St. Petersburg. Returned to Paris, 1891. Acted at Odéon, Grand, and Porte-St.-Martin. In 1900 appeared as Coupac in *L'Assommoir*. In 1902 and 1909 appeared in London theatres. Played the cock in Rostand's *Chantecler* (1910). Played in *Le Juif polonois* and *L'Aiglon*, and represented Crainquobille in Anatole France's play.

Guity, Sacha (b. 1885), Fr. playwright and actor; b. at St. Petersburg, where his father, Lucien (q.v.), was director of the Théâtre Michel. His first known play, *Nono*, was produced in 1905. He has written about forty-five pieces, including *Debureau* (1918), *L'Amour masque* (1923), and *Un Miracle* (1927), in all of which, except about half a dozen, he has acted —being indeed almost a necessary item in their interpretation. Two of those in which he does not appear are serious plays, *Jacqueline* (1921) and *Un Sujet de roman* (1923) —in the latter his father appeared.

Guittone of Arezzo (d. 1294), It. poet, b. in Tuscany; fought in the wars between Florence and Pisa, and in 1267 became a brother of the military order known as the Fratelli Gaudenti. He founded the Camaldolesian monastery, Degli Angeli, at Florence, but d. before it was completed. As a poet he ranks high as one of the founders of It. literature, being the first to give polish and regularity to the sonnet, while his prose style also had considerable influence for good. He is mentioned by Dante and Petrarch. His poems mostly appear in old collections of It. poetry, such as *Antichi Poeti* (Venice, 1532). His prose writings and letters were pub. by Bottari at Rome in 1745.

Guian, city of Samar ls., belonging to the Philippine group. It is situated in the S. of the archipelago. Pop. 12,000.

Guizot, François Pierre Guillaume (1787–1874), Fr. historian and statesman, b. at Nîmes, of Protestant family. His father d. on a scaffold during the revolution and the family fled to Geneva, where G. was educated. In 1805 he went to Paris to study law, but met with literary people who fired his aspirations, and in 1812 he became modern hist. prof. at the univ. of France. The same year saw the pub. of his trans. of Gibbon's *History*. In 1815 he became secretary for the interior and was promoted the

following year to the State Council. During the next few years he led the 'Doctrinaire' party, but on the break-up of the Duc Decazes ministry (1821) he was stripped of office, and a year or two later was forbidden even to lecture. During this period he produced his *History of the English Revolution* (vols. I–II.), 1826–27; *History of Civilisation in Europe* (1828); and the *History of Civilisation in France* (1829–32); all of which have appeared in Eng. trans. In 1830 he again took to public life as deputy for Lisieux (Normandy), and after the July revolution became a cabinet minister, finally promoted, when the Cabinet was reorganised (1832), to minister of education. In 1840, when his rival Thiers became foreign minister, G. came to London as ambas. and was very cordially received, but returned to Paris after a very brief sojourn. The next task which he attempted was the complete reconstruction of the Fr. ministry and reorganisation of public administration, which occupied him until the 1848 revolution. In 1847 he became Prime Minister, but at once involved himself in a disgraceful intrigue over the 'Sp. marriage' question; he aimed at Palmerston's foreign policy in this, but succeeded only in causing bad feeling between England and France. The revolution was largely due to his iron-handed firmness in carrying out his schemes; after this he took no further part in political life, but retired to his home at Lisieux and concentrated on literary work. The first eight years of his retirement were occupied in the completion of his *History of the English Revolution* (vols. III.–VIII.), 1850–56; his *Mémoires* appeared in nine vols. (1858–1868), and his daughter, Mme de Witt, pub. his *Child's History of France* (5 vols.), 1870–75. His only remaining work of importance is the remarkable biography of Washington (1840). G. is considered to be the founder of historical science, as opposed to the old style of chronicle pure and simple. His writings leave much to be desired in point of form and style, but are highly suggestive, well reasoned, and full of striking ideas. See G. Bardoux, *Guizot*, 1894; M. Guizot, *Les années de retraite de M. Guizot*, 1901; H. P. Thieme, *Guide bibliographique de la littérature française de 1800 à 1900*, 1907; and C. H. Pontas, *Guizot pendant la Restauration*, 1814–30, 1923.

Gujarat, in its widest sense, denotes the whole region in India in which the G. language is spoken; in its narrower and more correct sense it applies to the central plain eastward of Cutch and Kathiawar. The various feudatory states such as Baroda, Cambay, Chota, Udaipur, Rajpipla, and Baria included in the linguistic region are now either integrated with Bombay Prov. or have formed groups among themselves (see INDIA. *Effect of Indian Independence on the Indian States*). The region, which has an area of 29,071 sq. m., contains parts of the W. Ghats and the Vindhya and Satpura Mts., and is watered by the Tapti, Nerbudda, and Mahi Rs. The soil is fertile, but

the climate unhealthy. Pop. 9,500,000, mainly Hindu in religion.

Gujranwala, dist. and tn. of the W. Punjab, Pakistan. The tn. is situated on the Grand Trunk road and N. State railway, 40 m. N. of Lahore. There are manuf. of silk scarves, jewellery, and brass goods. Pop. about 42,000.

Gujrat, tn. and cap. of the dist. of the same name in the W. Punjab, Pakistan, 72 m. N.W. of Lahore. It has industries of brass vessels, footwear, inlaid articles, and textiles. Here, on Feb. 21, 1849, Sir Hugh (later Lord) Gough defeated a Sikh army of 60,000 men, the victory leading to the cap. of G., then a Sikh fortress, and the surrender of the Punjab. Pop. 40,000.

Gulbarga, see KULBARGA

Gulek-Boghaz, or The Cilician Gates, pass in the S.E. of Asiatic Turkey. From earliest times the main road from all parts of the plateau has been through here.

Gulf: 1. Tract of the sea extending into the land similar to, but larger than, a bay 2. Term applied at Cambridge to that section of an examination list coming between the creditable passes and the complete failures.

Gulfport, port for the Pearl R. customs dist., situated in Mississippi, U.S.A., 13 m. from Biloxi. It has saw-mills and canning factories. Pop. 15,100.

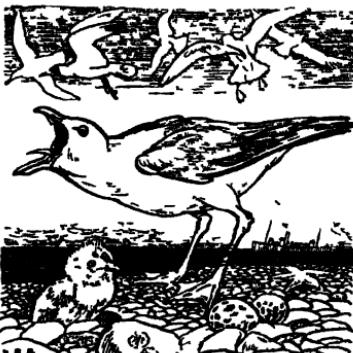
Gulf Stream, ocean current in the N. Atlantic. It issues from the gulf of Mexico, which gives it its name, being formed from the warm waters of the equatorial current, and flows out northward through the gulf of Florida and along the E. coast of N. America, from which it is separated by the 'cold wall,' a narrow strip of cold water. It is early joined by another current coming from outside the W. Indies. When leaving the gulf the G. S. is from 50 to 100 m. wide, and 2000 ft. deep, and moves with an average velocity of 80 m. a day. Its temp. is then about 80° F., but as it flows northwards the temp. drops, and the current becomes broader and less rapid. At a point off Newfoundland it merges into the G. S. Drift, which flows eastward across the Atlantic, and later divides into two branches, which flow N. and S. respectively. According to MacKinder the G. S. ceases fully 1500 m. from the nearest shore of Britain.

Gulfweed, floating seaweed, *Sargassum bacchariflorum*, found in large quantities in the Sargasso sea. The Gulf Stream carries it northwards from the gulf of Mexico. It has small, bladder-like berries.

Gull, Sir William Withy (1816-90), Eng. physician, b. in Exey; educated at Guy's Hospital, London. From 1847 to 1849 he was Fullerian prof. of physiology at the Royal Institution of Great Britain, and from 1856 to 1865 a physician and lecturer at Guy's Hospital. He was elected a fellow of the Royal College of Physicians in 1848, and in 1871 attended the Prince of Wales during his attack of fever. For his services in this respect he was made a baronet and appointed physician to the Queen in 1872. His numerous works, which have been edited by Dr. Acland,

include *Gullstonian Lectures on Paralysis* (1849); *Report on Cholera* (1854); *Hypochondriasis*; and *Abscesses of the Brain* (1854).

Gull (Welsh *gyylan*), name applied to a group of sea-birds, members of the div. Larines of the family Laridae. Under the most recent classification forty-nine species of Gs. are admitted and these are placed in five genera: *Pagophila* (the Ivory G.) and *Rhodostethia* (which has a small bill and wedge-shaped tail), in each of which there is only one species, *Rissa* (in which the hind toe is wanting) and *Xema* (the members of which have forked tails), each containing two species, and *Larus* (with square tails), in which are a



GREATER BLACK-BACKED GULL

large number of varying species. Among the most common are the black-headed (*L. ridibundus*), which frequents marshy coasts; the herring G. (*L. argentatus*), a large and handsome variety; the common G. (*L. canus*); the lesser black-backed (*L. fuscus*); the greater black-backed (*L. marinus*), which is one of the largest species; and the glaucous G. (*L. glauces*) which is circumpolar in its distribution. The smallest species are the *L. minutus* and the *L. philadelphicus*.

Gullet, or *oesophagus*, tube lined with mucous membrane which is separated by cellular tissue from its muscular foundation. The muscular fibres are striped in the upper portion and unstriped in the lower. The mucous membrane is thrown into a number of longitudinal pleats to allow of stretching. Compound racemose glands secrete a viscid mucus, and occur throughout the whole length of the G., though they are most numerous at the bottom. In man the tube is 9 to 10 in. in length, and from $\frac{1}{2}$ to 1 in. in diameter, and extends from the lower part of the pharynx, passes along the front of the spine, and terminates with about 1 in. of it in the abdomen at the cardiac end of the stomach. Among certain mammals, e.g. ruminants, a layer of voluntary muscle in the G. allows of antiperistaltic movements being induced by which food can be regurgitated into the mouth.

Gum. Gs. are the solidified exudations of different parts of plants (branches, stems, fruits, etc.), or are contained in the plant juices themselves. They belong to the carbohydrate group, are odourless, tasteless, amorphous substances which on treatment with water form either clear solutions or gelatinous liquids. The following are the prin. kinds met with commercially: *G. arabic*, obtained from various species of *Acacia*, sometimes known as *G. acacia*, is probably a calcium potassium salt of gummic acid (first prepared by dialysis by Graham). The *G.* occurs in rounded lumps which in some cases are almost transparent, while in others opaque owing to the large numbers of minute cracks. When treated with water it swells up and eventually dissolves, giving a solution with marked adhesive properties. On treatment with dilute sulphuric acid it gives galactose, and on oxidation a mixture of mucic and saccharic acids together with oxalic and tartaric acids. It is used in the dressing or finishing of fabrics such as silks and calicoes, and, when mixed with glycerine, for making gummed labels. *G. senegal* is closely allied to *G. arabic*, and is often used to adulterate it. It is derived from *Acacia Verek*. *G. tragacanth*, sometimes known as *G. dragon*, is obtained from different species of *Astragalus* which flourish in Persia, Syria, and Kurdistan. *G. tragacanth* forms curious horny translucent masses which swell slowly when treated with water, yielding a thick mucilage of low adhesive power. It is mainly used in the dressing of fabrics and in calico-printing, but is also employed in the manuf. of metallic-filament lamps for electric lighting. *G. tragacanth* probably belongs to the bassorin group of Gs. The Gs. exuding from cherry, plum, and apricot trees form a group apart. On hydrolysis they yield arabinose, and on oxidation oxalic acid. Under the term *G. resins* are included the juices of certain plants which are mixtures of Gs. and resins. On treatment with water partial solution of the *G.* takes place and the resin is held in suspension. The best known specimens of this class are *G. ammoniacum*, *G. euphorbium*, *G. galbanum*, gamboge, and myrrh. Possibly caoutchouc and gutta-percha might find place in this group.

Gumal Pass, or Gomal. mt. pass of Afghanistan, and the chief on the Indian frontier, between the Khyber and the Bolan. It forms a connection between Dera Ismail Khan and the *G.* valley.

Gumbinnen, manufacturing tn. of the R.S.F.S.R., formerly of E. Prussia, Germany, on the Pissa, 72 m. E. of Königsberg (Kaliningrad). The first important engagement between the Ger. and Russians in the First World War took place here on Aug. 19-20, 1914. In the Second World War *G.* fell to the Red Army early in 1945. Pop. 17,400.

Gumbum, see KUMBUM.

Gummersbach, tn. of Germany, situated in the Rhineland, 24 m. E. of Cologne. Pop. about 18,000.

Guill's Disease, see under MYXOEDEMA.

Gummic Acid, see ARABIN.

Gumming, contagious disease which commonly attacks the vine and the plum, cherry, pear, peach, and other trees. It is due to the ravages of a fungus, *Coryneum beterinkitt*, which converts the cells of the host into gum. It is best to destroy the diseased tree, but the treatment consists in frequent washings. Excess of manure is often the cause.

Gumti, riv. of the United Provs. and Oudh, India, rising 520 ft. above sea level. Its course is generally S.E. for 365 m., until it enters the Ganges, 25 m. from Benares.

Gumürjina, tn. situated in Adrianople, W. Thrace, on the R. Karaga. Wheat, barley, maize, etc., are grown, copper and antimony are mined, and there is a trade in wine and silk. Pop. about 25,000.

Gun, name applied generally to a weapon from which is discharged by means of an explosive projectile. The word is, nowadays, applied almost exclusively to cannon and to the weapons used for sport. The military weapons, such as a musket or a rifle, are in technical language called small arms. Originally the *G.* was employed for purely military purposes; it was not until very much later that the weapon began to be generally used for sport. The origin of the name *G.* is not certainly estab. Skent refers it to Welsh *gun*, a bowl. Others derive it from the O.F. word *mangonel*. The name is applied really only to the tubular weapon, together with its stock, as used for hand-firing. The hand *G.* was in fairly general use by the middle of the fifteenth century, but at this time was of very rude construction. It consisted simply of a tube of brass or iron which had a touch-hole at the top and a straight stock which was placed under the armpit when the weapon was to be fired. The soldiers carried long matches made of cotton soaked in a strong solution of saltpetre. Cavalry also carried this type of *G.*, which was suspended by a cord over the shoulder and which when about to be fired was placed on a forked rest. The latter when not in use hung down by the side. During the early Tudor period an improvement in the shape of a matchlock *G.* was invented. This had a cock at the side of the *G.* which held the match, and by means of a trigger the match was brought into contact with the gunpowder. This improved weapon, with a bent stock and broad butt, was generally termed an arquebus and was a lighter weapon than the later musket. A smaller weapon was at the same time used, constructed on much the same principle, but which may be regarded as the forerunner of the later pistol.

The next improvement in *G.*-making was the invention of the wheel lock, a weapon which carried a wheel at the side of the priming pan. This wheel was wound tightly up and could only be released by the trigger. When the trigger was pulled the wheel revolved, and by means of its rapid action on a piece of iron pyrites on which it rested gave forth a number of sparks which ignited the

powder. This weapon, however, did not come into general use, since its mechanism was somewhat involved and therefore expensive. Nevertheless it remained in use until the reign of Charles II. About the middle of the sixteenth century the musket was invented by the Spaniards. This weapon was much heavier than the Gs. previously used, and carried a much heavier shot. It necessitated the use of a forked rest, but proved of such great value that it was generally adopted throughout Europe. It was made on the matchlock principle, and it carried a ball of about 1½ oz. During this period the snaphance was invented in Germany. During the early part of the seventeenth century the firelock or flintlock was produced. This did away with the necessity for filling the priming pan, either from a flask of powder which was carried for that purpose or by biting off the top of the cartridge as was the later practice. From William III.'s time, for example, the raising of regiments of fusiliers dates. These were regiments which carried a fusil or musket made on the principle of the firelock or flintlock. This weapon was of the type of the famous Brown Bess used during the War of the Sp. Succession by Marlborough's troops. This type of weapon, however, was always liable to misfire, since the priming could not always be kept dry. To obviate this difficulty early in the nineteenth century percussion caps were invented, but were not used in the army until some considerable time later. By the end of William IV.'s reign, however, we find them in fairly general use. In 1842 the last improvement took place in the weapons of the Brown Bess type, but these were within ten years replaced by the use of rifles in the Brit. Army. Rifles did not at first altogether replace the percussion musket, but with the improvement of the rifle the use of muskets was abandoned altogether (1855). The rifle was a form of musket in which, by means of grooves in the bore, the bullet was made to rotate before leaving the barrel. The effect of this rotation is to ensure a more accurate flight of the projectile. The grooves in the bore were usually spiral in form, although some seem to have been made with straight grooves. The principle of rifling was discovered early in the sixteenth century, but does not seem to have been generally used except for purposes of amusement. Some rifle regiments were formed both in France and in England, but the difficulty of loading, and the waste of time which it entailed, prevented the general adoption of this method of warfare. The difficulty, however, was gradually being overcome, and by 1835 a regiment of riflemen had been raised and armed with rifles made on the percussion principle. This, in fact, was the first recognition by the army authorities of Forsyth's invention of the percussion cap. In 1835 Greener produced an expansive bullet which was rejected by the army authorities on the ground that it was a compound bullet. It had, however, shown the advantage of rifle fire over musket fire, and had also shown that the

difficulty of windage and the erratic flight of the bullet could be overcome. In 1851 the Minie bullet was adopted by the Brit. military authorities, and this Minie rifle was used during the Crimean war. In 1855 the Enfield rifle was invented, and was adopted by the authorities, being used in the later stages of the Crimean war and taking the place of the Minie rifle. The Enfield rifle was in general use until the adoption of the breech loader in 1867. During the Amer. civil war breech-loading Gs. were used by the federal cavalry, and in 1867 Snider's method of converting the muzzle-loading Enfield into a breech loader was adopted by the military authorities of Great Britain. The celebrated needle G. invented by Nicolaus von Dreyse (1787-1867), which was of such great importance during the short Austrian war, had been adopted some time previously; in fact, the Prussians were the first to appreciate thoroughly the value of a breech-loading bolt action weapon. In 1871 the breech-loading Martini-Henry rifle was adopted by the Brit. military authorities. The calibre of this rifle was .433 in., and it had a falling block action. Various improvements were continually being made until a great step forward was made by the invention of a magazine G. Russia was again to the fore in the adoption of this new invention, and in 1884 it adapted the Mauser rifle to the magazine rifle. Not unnaturally France followed suit, but adopted a rifle of different pattern. In the meantime, after a series of experiments and exhaustive commissions, the Brit. War Office adopted a new rifle in the shape of the Lee-Metford Mark I. in 1888. In 1891 the Lee-Metford Mark II. was adopted, this being a six-cartridge magazine carbine with bolt action and firing smokeless powder, which had come into general use in 1890. This rifle was subsequently still further improved, and became known as the Lee-Enfield rifle. Cordite was introduced as a smokeless explosive adapted to both the Lee-Metford and Lee-Enfield types of rifle, both of which took cartridges made from cordite. Both these rifles also were small-bore magazine rifles, the whole length of whose barrel was protected by a wooden handgrip. The length of the barrel was 21 in. In 1900 Great Britain had adopted a rifle of the bolt action type, but had rejected the multiple loader by means of a charger. This adopted weapon was given up in 1903 when the short rifle came into prominence. Up to 1903 the principle adopted by the musketry regulations had been to use the rifle as a single loader whenever possible and to reserve magazine fire for special emergencies. The long Lee-Metford and Lee-Enfield rifles (with bayonets five inches longer than before) were fitted out with a charge-loading apparatus and issued to the infantry of the territorial force.

The massed formations in attack used by the Gers. in the First World War needed an automatic G. to resist them; otherwise they would have overwhelmed their opponents before suffering any

appreciable number of casualties. Consequently the number of machine Gs. of the Allies rapidly increased. Early in the First World War the Lewis light automatic G. was invented and used extensively, and it is still in use, being the prin. weapon of half the infantry in the Brit. Army. It is not regarded as a 'specialist' weapon, and instruction in its use is a normal part of training. The G. is air-cooled, is fed by circular pan-shaped magazines, each holding forty-seven rounds of .303 S.A.A. The weapon is shoulder-controlled, can produce a large volume of highly concentrated fire, has many delicate parts, and therefore requires careful handling. Its rate of fire is between 600 and 700 rounds per min., best delivered in short bursts of four or five rounds at intervals.

As a result of the First World War experience a new Mark VI. S.M.L.E. rifle was approved. This has an aperture sight, and has a much stronger body and barrel than its predecessor. As a result of experience, opinion has grown in favour of a streamline bullet, but this requires deeper loading, thereby reducing the space allocated to the charge, and great care is required in ensuring exact concentricity as this governs the flight. (See also ARMS; BULLET; and, for further information on sporting Gs., see also RIFLE.)

Cannon.—An old name for Gs. as used by the artillery and as contradistinguished from hand Gs. The name is derived from the Lat. *canna*—a hollow reed. It is difficult to establish when cannon were first used in Europe, but they were first used in Great Britain by Edward III. in his campaign against the Scots in 1327. They were then called 'crakys of war.' The Fr. appear to have first used them in 1338. Originally cannon were somewhat in the nature of mortars, constructed by welding together iron bars, strengthened by iron hoops. A good specimen of this type of early cannon is 'Mons Meg,' now in the Tower of London. The earliest patterns were loaded and fired at the muzzle, but breech loading and firing was not long in developing. A form of cannon was the bombard—from the Gk. *σφραγίς*—the noise made when it was fired. These were made of hammered iron originally, but later on they were cast from a composition called G. metal. A G. of this pattern was found on the coast of Ireland, and is supposed to have been used by the Sp. Armada. Gradually the term cannon was used to describe all sorts of missile-throwing machines, small as well as large. It was the custom in the Middle Ages to give these weapons personal names, such as the Devil, the Twelve Apostles (for a battery of twelve), a survival of which is seen in Queen Elizabeth's Pocket Pistol at Dover. Many types of cannon were named after serpents. The name culverin remained until a very late date. The mounting of cannon was very crude in the early days; they were simply laid on pieces of timber to which they were fastened. For mobility wheels were fixed to the timber. Elevation was obtained by fixing to the front portion of the timber,

called the carriage, an arrangement similar to that used for high-jumping, i.e. a vertical stand pierced with holes so that the cross-bar could be raised or lowered. Another method was to fix the cannon to gimbals which swivelled round in any direction from a bench. These Gs. were controlled by hand and were loaded at the breech. In the seventeenth century red-hot shot was fired from cannon, the idea having occurred to a Ger. Improvements in the construction of cannon were noticeable in the sixteenth century in Switzerland, where the casting of a whole cannon was experimented with, the bore being 'bored out' from the solid. The Flemings were considered the masters in everything pertaining to cannon in the fourteenth and fifteenth centuries, and many of the chief positions in the artillery of England were held by them. They were also the writers of all the authoritative manuals on the construction and employment of cannon. The numerous wars in Europe during the seventeenth and eighteenth centuries gave ample scope for the employment of cannon and improvements were constantly being made, until a light cannon or G., with fairly good accuracy, was evolved which was eventually displaced by the modern field G. See also ARTILLERY; HOWITZER.

Gunboat. The main principle which underlies the construction of a boat of this type is that she shall to all intents and purposes be simply a floating gun-carriage. The earliest type of G., constructed about the middle of the nineteenth century, was of about 180 tons, 75 ft. long, with a speed of about 8½ knots. Various improvements were made on the type of boat, until at the present time we have specially constructed Gs., which are used to a very great extent for iv. service and which have a displacement tonnage of about 700 tons. The average speed is just over 12 knots an hour, and they carry two 4-in. quick-firing guns, four 12-pounders, and ten machine guns. The boat is steel built and copper sheathed, and about two and a half times as long as the earliest type of G. Boats of this type are used a great deal on the R. Nile. In the Second World War Brit. Gs. were used against the Axis in N. Africa and by the Amers. in Chinese waters.

Gun-carriage, support of a very large piece of ordnance. It is built in order to be able to stand very heavy strains. It has to withstand the shock caused by firing the piece, and it has also to be of great stability in order to be able to stand the strain of being drawn at a rapid pace over broken or rocky ground. The detachable front consisting of two wheels, axle, and shafts, to which horses were harnessed, is called the limber. There is a special dept. in the arsenal at Woolwich which attends to the manuf. of Gs. This dept. is of sp. vital importance since the G. must of a necessity be neither too heavy nor too cumbersome to be easily moved.

Gun-cotton, regarded usually as a nitrate of cellulose, is probably a mixture of nitrates. It is produced, briefly, by the action of strong nitric acid and

sulphuric acid on cellulose. Early in the nineteenth century the action of concentrated nitric acid on fibrous or woody bodies was noted, and finally Pélouze made the discovery that cotton when treated with concentrated nitric acid became a highly explosive body. Following on these experiments Schönbein commenced his discovery of G. proper, i.e. cotton which had been treated with nitric acid and which had then become an exceedingly explosive substance. The modern method of manuf. is based essentially upon the method discovered by Schönbein. Cotton waste which has been carefully cleaned and dried is treated with a mixture of concentrated sulphuric and nitric acid. The sulphuric acid is used in quantities in excess of the nitric and its chief use is to absorb the water produced during the process and to keep the nitric acid constantly concentrated. The process takes place at the ordinary temp. and lasts for from three to four hours. After being carefully washed and cleaned so as to remove the impurities which give rise to sulphates, the G. is pulped and either compressed into blocks, or dried in its ordinary state. It still retains the appearance of ordinary cotton waste, and does not explode save under confined conditions. The chemical formula is $C_6H_7O_4(NO_2)_3$. Mixed with nitroglycerin (g.v.), it forms the useful propellant explosive cordite.

Gundagai, tn. of New S. Wales, Australia, situated in Clarendon co., 95 m. N.E. of Albany, in the vicinity of the gold-fields. Pop. 2000.

Gung'l, Josef (1810-89), Hungarian composer and conductor, b. at Zsámébék; was a bandmaster in the Austrian Army (1835-43); in 1843 estab. an orchestra, with which he toured in Europe and America. He became director of music to the king of Prussia in 1849, and to the emperor of Austria in 1858. He composed numerous popular dances, marked by easy and rhythmical melody, of which the *Amorellen* waltz is perhaps the most popular.

Gunib, fort, (n. of Daghestan, Caucasus, R.S.F.S.R.), 75 m. N.W. of Derbent. It stands at an altitude of 4020 ft. close to G. Peak (7718 ft.) and was the last refuge of Shamil, the Circassian chief who surrendered to Russia in 1859. Pop. 1000.

Gun-metal, alloy consisting of about nine parts copper, one part tin, together with small quantities of lead and zinc. It is a tough reddish metal, much used for making castings for bearings and other engineering purposes, and formerly used for making ordnance. It requires careful casting as the constituents are somewhat liable to separate in the process.

Gunnery, science which governs the employment of firearms. The science is itself very detailed, since a knowledge of it requires a knowledge of the metals from which the guns are made, the method of their manuf., and an ability to calculate the strain to which its use will subject the weapon. Again the science must calculate the probable effect of the missile upon the object fired at, the velocity of the

projectile when fired, and the effect of the forces which will be brought to bear upon the missile both before and after it leaves the gun. The subject has been frequently treated in books pub. from time to time, the earliest being pub. fairly early in the sixteenth century. But literature on the subject increased enormously during the nineteenth century and is increasing almost every day. The science is to-day far more exact than it has ever been. Calculating tables and instruments have been produced, and have reached such a pitch that it is possible nowadays to calculate, before a shot is fired, the range of a gun, where elevations and calibre are known, and usually such calculations are well within the mark. The intricate calculations and the delicate mechanism, both of the modern gun and of the modern instruments, are such that G. may now be regarded as an exact science. On the various operations involved in spotting and attacking hostile aircraft see ANTI-AIRCRAFT DEFENCE. See also ARTILLERY. See The Official Text-book of Gunnery; Ordnance and Gunnery.

Naval Gunnery.—Adm. Sir Percy Scott, a great expert on naval G., laid particular stress on 'director' firing (see his *Fifty Years in the Royal Navy*, 1919). Prior to the First World War the regular pub. of the ann. returns of the gunlayer's test gave Scott a conspicuous position in the public eye, and there has been controversy over the alleged neglect by the authorities to adopt his inventions. The opposed or anti-fisher school of thought suggests the problem of naval fighting, in the days preceding the First World War, was never contemplated as a whole; but it is to be borne in mind that 'director' firing, to which this school attaches such great importance, would not by itself have achieved for naval G. all that a naval action demanded. There are other and more important elements to be taken into account; for, in default of some device for knowing and keeping the range in the conditions in which a ship should fight, the 'director,' so far from giving increased efficiency, might lead to worse results than individual laying. This fact would seem to have been clearly proved by the Ger., whose naval guns were far more accurate than the Brit. It is true that a study of the actions of the Dogger Bank and of the Rufiji R. reveals that the Ger. broadsides fell persistently short or just over the target for hours without making one hit; but this result is exactly what might be expected of a broadside which was fired, not only as a single gun, but in which each gun, of necessity, behaved exactly like every other gun. With less mechanical uniformity of firing the broadside would, on the law of averages, have occasionally straddled the target or hit it; and failure was due to the fact that, while the aiming and gun were good, the arrangements for finding and keeping the range were defective. Again the battle of Jutland affords no proof that the 'director' by itself guarantees efficiency; and it is significant that only one Ger. ship (*Blücher*) was sunk by gun-fire.

Lord Jellicoe indeed tells us that his range-finders were not equal to the conditions of light or visibility, and that he dared not manœuvre his fleet under large helm, for to do so would have meant putting his artillery out of action. Owing to the fact that space on a warship is limited and the platform not stable, the naval gunner's problem of defeating aircraft attack is even more difficult than that of the land-based anti-aircraft gunner. Naval fire control work calls for precision in the highest possible degree—a precision which must keep pace with the ever-increasing speed of aircraft (*see also ITADAR*).

Gunnigfeld, com and small tn of Westphalia, Germany, situated in the gov of Arnsberg. Pop about 10,000.

charcoal, sulphur, and saltpetre. This substance has had an enormous influence on the hist. of the world; it revolutionised the art of war, and has not been without its effect on the arts of peace. It is perhaps scarcely possible to speak about the discovery of G., since if it was discovered we have no definite proof of the fact, and what facts we have at our command seem rather to prove that it was but the development which went on for some considerable time. The names, however, of Friar Roger Bacon and the Ger Schwartz have usually been associated with its discovery. Schwartz is supposed by the greater number of authorities to be the inventor of G., but we have proof that G. and cannon existed previous to the date



THE GUNPOWDER CONSPIRATORS. FROM AN OLD PRINT

Gunning, Elizabeth, Duchess of Hamilton and of Argyll (1734-90), celebrated beauty, daughter of John G. of Castle Coote, Co. Roscommon, Ireland. In 1751 she and her sister Maria (*q.v.*) went to London and attracted great attention as 'the handsomest women alive'. In 1752 Elizabeth married James, sixth duke of Hamilton, who d. in 1758; and in the following year she married John Campbell, marquess of Lorne, who was afterwards fifth duke of Argyll. She and her sister were frequently painted, and numerous engravings of the portraits exist.

Gunning, Maria, Countess of Coventry (1733-60), celebrated Eng. beauty, said to have been more handsome than her sister Elizabeth (*q.v.*). She was once mobbed by a crowd in Hyde Park, and the king accordingly gave her a guard. In 1752 she married George Willmott, sixth barl of Coventry.

Gunnison, riv. of Colorado, U.S.A. Its source is in the N. of Saguache co., and its course is W. and N.W., until it enters the Grand R. at Grand Junction, about 25 m. E. of the W. borders of Colorado. There are numerous canyons.

Gunpowder, explosive composed of

when Schwartz is supposed to have invented it. Bacon himself does not appear to have been aware of many of the properties of G., although he may have been the first person in England to make it. He, however, regarded it to a very great extent as an explosive which was to be used for purposes of diversion, although he was aware of its explosive properties, and probably realised that it could be used for blowing people up. Many references to the existence and use of cannon and G. are found between the years 1327 and 1340. Edward III. is supposed to have used cannon against the Scots in the early wars of his reign, whilst we find another reference to the existence of G. in England in 1338. In Richard II.'s reign it was in fairly common use, and Henry V ordered that G. should not be taken out of the country without licence. Henry V. used it before Harfleur, but it did not become really effective till the end of the fifteenth century. Though superseded for most purposes by more powerful explosives, G. is still employed in fireworks, sporting cartridges, etc.

Gunpowder Plot, conspiracy to blow up the Houses of Parliament and the king

(James I.), who was to be present to open Parliament on Nov. 5, 1605. It was contrived by a number of Rom. Catholics, with Robert Catesby at their head, and seems to have been brought to a head by the revival, in 1604 and 1605, of measures of repression against the Rom. faith in England. It is known that Catesby was conceiving a plan in May 1603, and in Jan. 1604 some details were arranged between himself, Robert Winter, and John Wright. They were later joined by Guy Fawkes, brought by Winter from Spain, Thomas Percy, Thomas Winter, John Grant, Ambroso Rokewood, Robert Keyes, Sir Everard Digby, Francis Tresham, and Thomas Bates, a servant of Catesby's, while two Jesuit priests, Greenway and Garnet, were also involved. In May 1604 the conspirators hired a house adjoining the House of Lords, and in Dec. began to work a mine from the cellar. In March 1605 they obtained possession of a vault under the House of Lords, and stored in it thirty-six barrels of gunpowder. In May they separated to make arrangements for the carrying out of the plot subsequent to the explosion. The plot was discovered through an anonymous letter, for which Tresham was probably responsible, sent to Lord Monteagle on Oct. 26. On Nov. 4 a thorough search was made, and Guy Fawkes was arrested at his post in the cellar. The efforts of Catesby to bring about the arranged rising were fruitless. The ceremony of searching the vaults of Parliament at its annual opening is a legacy of the G. P. The plot made a deep impression on the country, and from then Nov. 5 has been commemorated as 'Guy Fawkes' Day' by the lighting of bonfires, in which 'guys' are burned, and by fireworks displays. See D. Carwell (ed.), *Trial of Guy Fawkes and Others*, 1934, and H. R. Williamson, *Gunpowder Plot* (a novel), 1919.

Güns (Hungarian *Kószege*), tn. of Hungary in the co. of Vas, situated on the Tisongyos. It has an extensive wine and fruit trade, and there are manufs. of earthenware and cloth. There is a noted castle. Pop. about 8500.

Gunst, Pieter van (1667-1724), Dutch portrait engraver, b. at Amsterdam. His work is neat and careful, but sometimes weak in drawing. Among his best engravings are those of A. Houbraken's drawings from Vandyck; of Brandon's 'William III. and Queen Mary'; of Holbein's 'Erasmus'; of van der Werf's 'Duke of Marlborough'; of Kneller's 'Queen Anne'; of Riley's 'Dryden'; and of Greenhill's 'Locke.'

Gunter, Edmund (1581-1626), Eng. mathematician, b. in Hertfordshire; educated at Westminster and Oxford. In 1619 he became prof. of astronomy at Gresham College, London. He was the inventor of sev. useful mathematical devices, including G.'s chain, used in land surveying, which is 22 yds. long and divided into 100 links; G.'s line, being a logarithmic line laid down upon scales, etc.; G.'s quadrant, used for finding times and altitudes; and G.'s scale, employed in navigation and trigo-

nometry. He pub. sev. mathematical treatises.

Gunter's Chain, see CHAIN.

Günther, Albert Karl Lewis Gotthilf (1830-1914), Ger. zoologist. He pub. 10 vols. of catalogue of the reptiles and fishes in the Brit. Museum (1858-70). *Fische der Südsee* (1873-1910) and *Reptiles and Batrachians of Central America* (1885-1902) are two of his many original contributions to zoology.

Günther, Johann Christian (1695-1723), a Ger. poet, belongs to the Silesian school of poetry, of which indeed he is the last representative of talent. His poem on the peace of Passarowitz and his lyrics, which reveal a deep emotionalism and a fine imaginative range, won Goethe's praise.

Gunther, King of Burgundy, see BRUNHILDA.

Gurdaspur, name of a tn. and dist. of Pakistan, in the Lahore div. of the Punjab. The tn., which was captured after a long siege by the Moguls in 1712, has a pop. of 8906. The dist. (1889 sq. m.) has a pop. of 852,000.

Gurgson, tn. and dist. in the Ambala dist. of the W. Punjab, Pakistan. The dist. rebelled during the mutiny. The commerce is chiefly in corn, hardware, and minerals. Pop. of tn. is 3000 and of dist. (1984 sq. m.) 682,000.

Gurhwal, see GARHWAL.

Guriiev, or Guriev Gorodok, dist. and tn. on the r. b. of the Ural, 11 m. from the Caspian Sea in the region of Uralsk, R.S.F.S.R. Pop. 10,000.

Gurkhas, see GHURKHAS.

Gurnard, or *Trigla*, genus of fish belonging to the family of malled-cheeks (*Triglidæ*). Gs. are bottom-fish and are best caught therefore with a trawling net; they keep near the coast and are represented by as many as forty species in temperate and tropical seas. Along British shores the most common are the grey and red G. (*Trigla gurnardus* and *T. pinnata*). The head of a G. is angular and bony, but the two most characteristic features are three detached finger-like rays, projecting beneath its mouth, which are at the same time organs of motion and of touch, and the pectorals which, when expanded, make a young fish look like a butterfly.

Gurney, Edmund (1847-88), Eng. psychologist. At Trinity College, Cambridge, he obtained a good classical degree, and later turned his attention to music, medicine, chem., and physics. In his *Power of Sound* he discussed the philosophy of music, but his fame rests on his psychological writings, including *Hallucinations*, an essay, and *Phantoms of the Living* (1886), a mass of data collected by G., Myers, and Podmore during their experiments in hypnotism and thought-transference for the Society of Psychical Research.

Gurney, Sir Goldsworthy (1793-1875), Eng. inventor, b. at Padstow, began life by practising as a surgeon, and disappointed his patients, when, shortly after 1823, he gave up the practice of medicine altogether. Faraday acknowledged his indebtedness to G.'s course of scientific

lectures, which were pub. in 1823. G.'s first invention was the oxy-hydrogen blow-pipe; later he discovered the splendid light obtained by the fusion of magnesia and lime (the 'Drummond light'), and soon afterwards the high-pressure steam jet, which was to revolutionise locomotion and was also invaluable in the purification of sewer gas. The systems of lighting and ventilation in the present Houses of Parliament were devised by G.

Gurney, Joseph John (1788-1847), Eng. philanthropist, b. in Norfolk, became a minister of the Society of Friends, and in social work supported the unselfish efforts of Zachary Macaulay and Wilberforce. The two causes into which he threw his best endeavours were the abolition of slavery and the improvement of prisons. In the latter he worked side by side with his sister, Elizabeth Fry. In *Prison Discipline* (1819) he unfolds his schemes of reform, whilst a Quaker's opinion of his own sect is revealed in his *Religious Peculiarities of the Society of Friends* (1824).

Guryev, region of the Kazakh S.S.R., in Central Asia.

Gustafsson, Greta Louisa, see GARBO.

Gustav Line, see und. ITALIAN FRONT IN SECOND WORLD WAR.

Gustavus I. (Vasa) (1496 1560), king of Sweden, b. at Lindholm, the son of Erik Johansson of Helsingborg and Cecilia Madsdatter. In 1514 he was sent to the court of his cousin, Sten Sture, and bore the Swedish standard in the battle of Brännkyrka (1518), when Sture defeated Christian II. of Denmark. During the subsequent negotiations he was one of the Swedish hostages, and was treacherously carried off by the Danes and imprisoned at København. He escaped and returned to Sweden in 1520. In the same year, roused with the rest of the nation by the news of the Stockholm massacre, he organised the revolt of the yeomen of Dalecarlia. The Danes were driven out and G. was proclaimed king by the parliament of Strengnas and crowned in 1523. The task which faced him in establishing the independence of Sweden was full of difficulties, as the country was in great poverty and there was an utter lack of capable statesmen. He made a treaty with the Danes at Malmo in 1524, but never felt safe with regard to them. His projects for the strengthening of the national monarchy were in constant danger from the Swedish peasantry, and between 1525 and 1542 he put down four rebellions. For political reasons he severed Sweden's connection with Rome and introduced the Reformation at the Parliament of Westerås in 1527.

Gustavus II. (Adolphus) (1591-1632), king of Sweden, was b. at Stockholm, the son of Charles IX. and Christina. He was carefully educated in languages, politics, military science, and Protestant principles, and succeeded to the throne in 1611 as a capable and practical ruler. In 1613 he terminated the war with Denmark by the peace of Knäred and in 1617 the peace of Stolbova closed the Russian war and gave Karelia and Ingria to Sweden.

In 1621 he resumed the war with Poland, of which the chief events were the capture of Elga and Mitau in 1621, the capture of Kokenhuzen and the invasion of Lithuania in 1625, the battle of Wahlhof, completing G.'s conquest of Livonia, the occupation of Pillau, the conquest of Ermeland, the surrender of Elbing and Marienburg, and the blockade of Danzig in 1626, the disastrous campaign of 1627, and the defeat of G. by Koilekpolski at Stuhm in 1629. The war ended with the truce of Altmark. G. then joined in the Thirty Years war, partly from a sincere desire to help the Ger. Protestants, but still more from a fear that the emperor might acquire the Baltic ports and so menace Sweden. The Swedish fleet set out in 1630 and the army



GUSTAVUS ADOLPHUS
Engraving after a picture by Van Dyck.

disembarked at Prenzlau in June. A successful campaign in Pomerania followed, and later in the year Magdeburg declared in favour of G. This city was invested by the imperialists and early in 1631 G. advanced to relieve it. The suspicions and timidity of the electors of Brandenburg and Saxony frustrated his designs, and Magdeburg fell in May. In Sept. the elector of Saxony definitely threw in his lot with G., and the allies defeated Tilly at Breitenfeld, near Leipzig. G. then marched towards the Rhine, took Marienburg and Frankfurt and wintered in Mainz (1631-32), and then resumed the pursuit of Tilly. In April he forced the passage of the Danube and the Isar, and finally defeated Tilly at Ingolstadt. In July Wallenstein united with Maximilian of Bavaria, and G., attempting to reach Saxony, was confronted with the allied army and defeated at Nuremberg in Sept. Wallenstein then retired southwards, but was overtaken by G. at Lützen. A terrible battle was fought on Nov. 16, during which G. was killed, while Wallenstein was forced to retire upon Leipzig.

G. was a wise and popular ruler, and succeeded in bringing the wealthy nobles and the lower classes into the working of a harmonious scheme. The gov. was reorganised on a departmental basis, and prosperity increased by the building of roads, and the promotion of commerce. G. married Marie Eleonora, sister of the elector of Brandenburg, in 1620, and had one daughter, Christina, who succeeded him. See C. R. L. Fletcher, *Gustavus Adolphus*, 1890, and Sir G. MacMunn, *Gustavus Adolphus: the Northern Hurricane*, 1930.

Gustavus III. (1746-92), king of Sweden, was b. at Stockholm, the son of King Adolphus Frederick and Louise Ulrica of Prussia. In 1766 he married Sophia Magdalena, daughter of Frederick V. of Denmark. In 1768, during his father's interregnum, he compelled the 'Caps' to summon a Diet which he wished to execute some monarchical reforms, but these were defeated by the 'Hats.' During the early part of 1771 he spent some time in Paris, where he was very popular, on a diplomatic mission. On his accession he attempted to mediate between the opposing 'Hat' and 'Cap' factions, which were leading the country into a position of great danger, but only succeeded in breaking the power of the oligarchical 'Caps' by the coup d'état of Aug. 19, 1772. The greater part of his reign was occupied in organising many useful reforms. In 1774 the liberty of the press was provided for; the army and navy enlarged; in 1777 the 'currency realisation, ordinance' righted the national finances; free trade in corn was promoted, and religious liberty was proclaimed. In 1786 the mutinous spirit of his Diet caused him to adopt an attitude of absolutism, which he maintained throughout the war with Denmark and Russia (1788-90). He was assassinated at Anckarstrom.

Gustavus IV. (1778-1837), king of Sweden, was b. at Stockholm, the son of Gustavus III. and Queen Sophia Magdalena. He ascended the throne in 1792. In 1797 he married Frederica Dorothea, daughter of the grand duke of Baden. His character was marked by an abnormal seriousness and piety, which, added to a hatred and fear of Jacobinism, led him to act in a most mistaken way in several directions, notably in the foreign policy of the country. In 1800 he joined the armed neutrality of the N. powers; in 1803 joined the Bourbon cause, and later allied himself with the coalition against Napoleon. In 1807 he refused the terms offered him by Napoleon, and thus lost Rügen and Stralsund, while Napoleon persuaded Russia to invade and annex Finland. By the end of 1808 it was obvious that G. was insane, and in May 1809 he was deposed. He d. in Switzerland in 1837.

Gustavus V. (b. 1858), king of Sweden, was b. at Drottningholm, the son of Oscar II. of Sweden and Norway, and Sophia Wilhelmina; entered the army and travelled considerably. In 1881 he married Victoria, daughter of the duke of Baden. He succeeded to the throne of Sweden in 1907, the union between Nor-

way and Sweden having been dissolved in 1905.

Güstrow, tn. in Mecklenburg-Schwerin, Germany. It stands on the Nebel, about 20 m. from Rostock, and contains several interesting old buildings, among them a cathedral, church, castle, and tn. hall. Pop. 20,000.

Gut, technically used in zoology as equivalent to the alimentary canal. Three parts have to be distinguished: (a) the fore-gut or stromodaeum lined by the outer layer or ectoderm; (b) the mid-gut or mesenteron lined by the inner layer or endoderm; (c) the hind-gut or proctodaeum lined by the ectoderm. These three typical parts, thus distinguished according to their origin, vary greatly in size and function in different classes, but the mid-gut is the most important on account of its digestive function, and because of its outgrowths (liver, etc.) in higher animals. In vertebrate anatomy the pharynx, gullet, and stomach are sometimes called fore-gut; the small intestine, mid-gut; the large intestine, hind-gut. In a human adult the small intestine is from 22 to 25 ft. long, and the large intestine, which is wider but much shorter, is connected to the small intestine at the ileo-caecal valve.

Gut of Canso, strait of Canada, situated between Nova Scotia and Cape Breton Is. It is 20 m. in length and from 1 to 2 m. wide.

Gutenberg, Johann Gensfleisch, or Henne (c. 1397-1468), Ger printer, was b. at Mainz. He is said to have been the inventor of the art of employing movable types in printing. About 1434 he settled in Strasburg, where he stimulated the art of block-printing by the invention of a press for the multiplying of impressions. At the end of 1444 he returned to Mainz and was occupied until 1450 trying to perfect his art. In that year he entered into partnership with a rich burgher named Faust or Fust, who lent him the money to set up a printing press. This partnership, however, was dissolved in 1455 when Faust brought an action against G. to recover his money, and in consequence of the verdict Faust secured the press. G. however, continued his work, but was not very successful commercially. The works ascribed to him are *The Bible of 42 Lines* (1452-53) which was sold in 1873 for £3400; *The Bible of 36 Lines*, and the *Catholicon*.

Gütersloh, tn. of Westphalia, Germany, which is famous for its rye-bread (*Pumpernickel*). Before 1839 it also manufactured silk and cotton goods, and had a large trade in Westphalian hams and sausages. Pop. 22,000.

Guthrie, Sir James (1859-1930), Scottish painter, b. at Greenock. He first studied under John Pettie in London, but afterwards went to Paris. His first pictures, 'The Gipsy Fires are Burning,' for 'Daylight is Past and Gone' and 'The Funeral Service in the Highlands,' are rather highly coloured, but his later ones are better. 'Schoolmates' is in the Ghent Gallery. He also painted portraits, some of his best being of Mr. Galloway, Major

Hotchkiss, and Professor Jack. He was president of the Royal Scottish Academy 1902-19.

Guthrie, Thomas (1803-73), Scottish preacher and philanthropist, b. at Brechin, Forfarshire. From 1815 to 1825 he was at the univ. of Edinburgh, but in 1826 went to study in Paris. In 1837 he became one of the ministers of Old Greyfriars Church, Edinburgh, and in 1840 was appointed to St. John's par. there. He supported Dr. Chalmers in 1843, who was against the intrusion of civil authority into church government, and his eloquence did much for the cause. He was also one of the first in Scotland to advocate compulsory education, and his name is associated with the cause of Scottish ragged schools, his *Plea for Ragged Schools* being pub. in 1847. Other works of his are *The Gospel in Ezekiel* (1856); *The City, its Sins and Sorrows* (1857); *The Way to Life* (1862); and *Christ and the Inheritance of the Saints* (1858).

Guthrie, Thomas Anstey, see ANSTEY, F.

Guthrie, cap. of Oklahoma, U.S.A., and the co. seat of Logan co. It was founded in 1889, and in 1890 made the cap. of the ter., becoming the state in 1907, when Oklahoma was made a state. It has considerable trade with the surrounding country, and manufs. cotton-seed oil, cotton goods, flour, cereals, cigars, lumber, brooms, and furniture. Pop. 10,000.

Guthrum (d. 890), one of the leaders of the Dan. host which encamped near Reading in 871, and fought against Ethelred and Alfred. He was finally defeated by Alfred at Ethandun in 878, and a treaty was made at Wedmore whereby G. pledged himself to withdraw from Alfred's kingdom. He afterwards occupied E. Anglia, and was baptised at Aller, Alfred standing godfather to him.

There was another G. (d. 916), who was king of E. Anglia, having succeeded Eorlric (d. 902) and was probably a son of G. (above). In 906 he made peace with Edward the Elder, but subsequently broke it and was slain at the battle of Tempsford. The E. Anglian Danes then submitted to Edward and their kingdom came to an end.

Guthry, Henry (c. 1600-76), Scottish bishop of Dunkeld, b. at Cupar-Angus. In 1632 he was presented by Charles I. to the par. church of Stirling, but opposed the king in 1636, when he was about to introduce a liturgy. In 1665 he was translated to the bishopric of Dunkeld. He was the author of *Memoirs of Scottish Affairs, Civil and Ecclesiastical, from the Year 1637 to the Death of Charles I.* (pub. 1702), a book which is of value as a contemporary account.

Guts-Müths, Johann Christoph Friedrich (1759-1839), Ger. teacher, b. at Quedlinburg. He was educated at Halle Univ., and in 1783 became a teacher of geography and gymnastics at Schnepfenthal. He introduced a new method of teaching geography, and it was largely owing to him that gymnastics became so popular in the schools of Germany. His handbooks explain his methods—*Gynnastik für die Jugend* (1793) and *Handbuch der Geo-*

graphic (1810)—but he also pub. *Deutsches Land und drutsch Volk* (1820).

Gutta-percha, name applied to the dried milky juice of trees found mainly in the ls. of the Malay Archipelago. These trees belong to the order Sapotaceæ, and often reach a height of 100 ft. and have trunks varying from 2 to 3 ft. in diameter. The name G. is Malay *gelah*, meaning gum, and *perja* being the name of the tree. The substance, which is similar to india-rubber, was formerly obtained by cutting down the tree and then stripping off the bark, but now the less destructive method of tapping the tree is employed. The milky juice soon coagulates on exposure to the air and is then kneaded under a supply of running water and rolled into sheets to expel the air and to enable it to dry quickly. It is afterwards put into



GUTTA-PERCHA

a masticator, which is heated, and revolved until it is fit for use. There are various kinds of G., but that from Singapore is considered the best. The substance has long been known to Europeans, having been imported in the form of native shoes, etc., but it was not until 1843 that they realised its value, or knew of its nature and usefulness. Dr. Wm. Montgomerie, of the Indian Medical Service, first noticed that the Malays used it for making handles to their knives, etc., and conceived the idea of employing it for medical instruments. After this it was imported to a great extent, and used for coating marine electric telegraph wires (although it has now been superseded by india-rubber), for making golf-balls, overshoes, beltings for machinery, tubing, etc., as well as for stopping teeth. It is also used by surgeons for splints, but it is chiefly employed now for electrical purposes because of its inability to conduct electricity. When imported G. appears in hard cakes of a reddish-brown colour, and when cut has a peculiar cheese-like smell. It becomes soft when put into hot water, and can be drawn out into threads, but hardens on cooling and is not brittle.

It is not affected by alkaline solutions or by dilute acids, but rapidly deteriorates when exposed to air and light. It differs from India-rubber in being non-elastic.

Gutzkow, Karl Ferdinand (1811-78), Ger. dramatist, b. at Berlin. He studied theology at the univ. of Berlin but the pub. of his *Forum der Journalliteratur*, in 1831, began his literary career. The same year he joined Menzel in Stuttgart, and worked on the *Litteraturblatt*, and in 1832 pub. *Maha-Guru*, a satirical romance. In 1833 his *Wally, die Zueiterin* appeared, for the pub. of which he was imprisoned, having shown himself in this book to be an advocate of the 'Young Germany' movement. On his release he went to Frankfort and Hamburg, where he wrote his tragedy *Richard Savage* (1839). Other plays of his are *Zopf und Schwert* (1844); *Das Urbild des Tartuffe* (1847); *Der Konigsteutnant* (1849), all three of which are comedies; and *Uriel Acosta*, a blank verse tragedy. In 1847 he became director of the Court Theatre, Dresden. He was also a writer of novels: *Serafine* appeared in 1838 and *Blaesdov und seine Söhne*, a satire on the education of the day. His *Die Ritter vom Geiste* was pub. in 1851 and *Der Zauberer von Rom*, a picture of Rom. Catholic life in S. Germany, 1858-61. G.'s works contain some very fine character drawing and are of interest for the glimpses they afford of the conflicts and intellectual problems of his time, but they are marred by the fact that he could not subordinate his political opinions to art. See lives by K. Freiburg-Ruter, 1930, and M. Schönfeld, 1933.

Guy, Thomas (1641-1724), founder of Guy's Hospital, b. in Southwark. He was educated at Tamworth, and in 1660 was apprenticed to a bookseller, but in 1668 set up in business for himself. By his trade, chiefly in Bibles, and his investments, especially in the South Sea Company, he amassed a large fortune, and in 1695 became member of Parliament for Tamworth, where he had founded an almshouse in 1678 for six poor women. He also built a tn. hall for Tamworth in 1701, which is still standing. In 1709 he contributed largely for the poor refugees from the Palatinate, and in 1712 subscribed to the fund for Bowyer, the printer, after his great loss by fire. In 1704 he became governor of St. Thomas's Hospital, and in 1707 built three new wards at a cost of £1000 and contributed yearly towards their support. In 1722 he began the erection of Guy's Hospital, on which he spent £18,793, and when he d. left for its endowment £200,000. He endowed Christ's Hospital with £400 a year.

Guyenne, see GUIENNE.

Guy of Warwick, hero of a Middle Eng. romance, versions of which existed in Fr. in the thirteenth century. The story is an account of G.'s foreign wars and of his marriage to Félicie, daughter and heiress of the earl of Warwick. His pilgrimage to the Holy Land is also related, and his defeat of the giant Colbrand, by whose death Winchester was delivered from the invading N. kings.

Guyon, Mme (née Jeanne-Marie Bouvier de la Motte) (1618-1717), Fr. mystic, b. at Montargis. She was acquainted with the duchesse de Béthune, and was also very friendly with Father Lacombe, who was imprisoned for his false mysticism in 1687. She preached her doctrine of quietism at Turin, Grenoble, Nice, Genoa, Veracelli, and Paris, where she settled in 1686, but was arrested in 1688 for having taught heretical opinions and for having corresponded with Molinos, the leader of quietism in Spain. After her release she became acquainted with Fénelon, who defended her conduct in a controversy with Bossuet. She was again imprisoned in 1695 and not released till 1702. Mme G.'s works, in 40 vols., including the *Autobiography*, were pub. in 1767-91.

Guyton de Morveau, Louis Bernard, Baron (1737-1816), Fr. chemist, b. at Dijon. He studied law in the univ. at Dijon and became a member of the Legislative Assembly in 1791, and was a member of the National Assembly in 1792 and 1795. From 1800 to 1814 he was master of the mint, and was made a baron in 1811. He contributed largely to the scientific periodicals of the day, and also pub. *Méthode d'une nomenclature chimique* and *Traité des moyens de désinfecter l'air*, which describes the disinfecting powers of chlorine and of hydrochloric acid gas.

Guzerat, see GUJERAT.

Guzman, Fernán Perez de, see PEREZ GUZZEH, see Gaza.

Gwalior, the premier Mahratta state in, and one of the largest native states of, W. Central India; lies between the United Prov. and the Central Provs. G., together with twenty-eight of the other states located in W. Central India, were formed into the Malwa Union (or Madhya-Bharat). It consists of hilly country and plains. The climate is extreme. The hilly part contains the small dist. of Anilghera. The cap. is G., or Lashkar; it is strongly fortified, the fortress being on a rock 340 ft. high. From 1845 to 1855 it was in Brit. hands. It is a centre for stone-quarrying and the carving industry. There is a fine irrigation system and good railway. The founder of the present dynasty, Ranaji Sindhyia, held military rank under Peshwa Baji Ras (1720) and estab. his headquarters at Ujjain. In 1782 Mahadji Sindhyia was recognised by Lord Hastings as an independent ruler. In 1886 G. fort was restored to Maharaja Sindhyia by Lord Dufferin. Area 26,400 sq. m. Pop. 3,524,000.

Gwelo, central tn. of S. Rhodesia, S. Africa. It is situated midway between Salisbury and Bulawayo, being 113 m. N.E. of the latter tn. by rail. It is the cap. of the midlands, was founded in 1894, and is a thriving centre of supply of an important mineralised dist. producing gold, chrome ore, silver, and asbestos fibre; and it is also an important rail centre. The chief farming crop is maize and the tn. is an important cattle centre. There are Anglican, Catholic, Dutch, and Presbyterian Churches. The memorial library was opened in 1935, and

the gov. hospital, the most modern in S. Rhodesia, in 1938. G. has a public park, an aerodrome, race-course, and golf links. It has a good water supply and electric light. There are gov. high schools for both sexes. The Selukwe, Que Que, and other goldfields lie at a distance of 12–30 m. from the tn. and the dist. is full of anct. mine workings. In 1934 anct. ruins of the Zimbabwo type were discovered near Daisyfield (40 m. from G.). Pop. (white) 2500.

Gwersyllt, par. and tn. of Denbigh, Wales, 2½ m. N.N.W. of Wrexham, situated in a colliery dist., with iron works. Pop. 5600.

Gwyn, Nell, or **Eleanor Gwyn** (1650–1687), Eng. actress and the mistress of Charles II. Of her early hist. very little is known, but when quite young she sold oranges somewhere near Drury Lano. She afterwards joined the acting profession, and made her first appearance in 1665 as Cydaria in Dryden's *Indian Emperor*, and afterwards in many other witty parts, being a general favourite with the public. Her two sons by Charles were Charles, made duke of St. Albans, and James Beauclerk, who d. young.

Gwynedd, realm of the early princes of Wales. It was the strongest of the sev. petty states into which Wales was formerly divided. It comprised the modern cos. of Carnarvon and Merioneth, together with a part of Denbigh.

Gwyniad, see under COREGONUS POLLAN.

Gwyry, see GOWER.

Gyangtse, fort. tn. of Tibet, situated on the trade route between Lhassa and Darjeeling. In 1904 the Eng. entered this tn. when on an expedition. Pop. about 5000.

Gyaros, Chiuira, or Giura, one of the Cyclades Is., about 10 m. from Syra. This is. was used as a Rom. place of banishment.

Gyetsva, see DETTVA.

Gyges, king of Lydia, was the founder of the Mermnad dynasty in the seventh century B.C. having put to death Canandaus, his predecessor and last of the previous dynasty. During his kingship he captured Smyrna, Colophon, and other cities and was successful against the Cimmerians. After helping the Egyptians against the Assyrians, he was again attacked by the Cimmerians, who took Sardis and put him to death.

Gylippus, son of Cleandridas, an exile from Sparta, was a Spartan general. In 414 B.C. G. was appointed commander of the Syracuseans against the Athenians, and in this he was entirely successful—Nicias being defeated. Afterwards, however, he was entrusted by Lysander with treasure from Athens, and, on being found guilty of appropriating some, was exiled as his father had been.

Gyllemborg-Ehrensvärd, **Thomassine Christine** (1773–1856), Dan. writer, b. at Copenhagen. When quite young she (then named Buntzen) married Peter Heiberg and became the mother of Johan Ludvig Heiberg. She was afterwards divorced and then married Baron Ehrensvärd. Her first novel, *Familien Polonius*,

appeared in 1827 in the jour. known as the *Flyvende Post*. Among her other works are *En Hversdage historie* (1828) and *To Tidsalidre*. See J. L. Heiberg, *Peter Andreas Heiberg og Thomassine Gyllemborg*, 1882.

Gyllenstierna, Johan (1635–80), Swedish statesman. After travelling in various countries he returned to Sweden and took an active part in politics there. He sided with the country against the aristocrats, to whom he belonged, putting the national interests before all others. About the year 1675 he became the adviser of Charles XI., and obtained an influence over him which lasted throughout his reign. In 1679 he was the chief promoter of peace at the congress of Lund.

Gymnastics, term signifying physical exercises practised for recreation or for promoting health. The gymnasium of the Gks. was originally the school where competitors in the public games received their training, and was so named from the circumstance that the competitors exercised naked (*γυμνός*). Athletic contests formed part of the social life of the Gks. from the earliest times, and their prin. religious festivals were marked by games. The victor in any such contest was rewarded with the honour and respect of his fellow citizens, and a victory was looked upon as an honour to the whole state. In these circumstances the training of athletes became a matter of public concern; accordingly special buildings were provided by the state, and their management was entrusted to public officials. Men were paid to look after the youths who were training for public contests, to conduct the games at the great Athenian festivals, to exercise general supervision over the morals of the youths, and to adorn and keep up the gymnasium. This office was one of the public services, and great expense was entailed on the holders. Under them were the *sophronizē*, whose duty was to watch the conduct of the youths at all times, and especially to be present at all their games. The practical teaching and selection of suitable exercises for each youth were in the hands of the *padotribē* and *gymnatis*, the latter of whom also superintended the effect on the constitution of the pupils, and prescribed for them when they were unwell. The *aleiptē* oiled and rubbed dust on the bodies of the youths, acted as surgeons, and administered any drugs prescribed. According to Galen there was also a teacher of the various games of ball. The gymnasias, built to suit these various purposes, were large buildings which contained not merely places for each kind of exercise, but also a stadium, baths, covered porticos for practice in bad weather, and outer porticos where the philosophers and men of letters read public lectures and held disputations.

The gymnasium of the Gks. did not long remain exclusively devoted to athletic exercises. It soon began to be put to other even more important uses. The gymnasium became connected with education on one side and medicine on the other. Due training of the body and

maintenance of health and strength of children were the chief part of the earlier Gk. education. The education of boys was conducted in the gymnasia, save that part devoted to letters and music. As they grew older philosophers and sophists attended to talk and to lecture in the gymnasia. In Athens there were three great public gymnasia—Academy, Lyceum, and Cynosarges—each of which was consecrated to a special deity, with whose statue it was adorned; Plato's teaching in the Academy has given that gymnasium immortality. Aristotle conferred lustre on the Lyceum, and Cynosarges was the resort of the Cynics. Plato, when treating of education, devotes much time to G. Prodicus is said to have first pointed out the connection between G. and health. The Gk. institution of the gymnasium never became popular with the Romans, who thought such training was conducive to idleness and immorality, and of little use from a military point of view, though at Sparta G. training had been chiefly valued as promoting bodily strength, such as was needed for the use of weapons and the endurance of hardship. The first public gymnasium at Rome was built by Nero, and another was built by Commodus. Rousseau in his *Emile* was the first in modern times to call attention to the serious consequences of neglecting G. And Pestalozzi and Froebel, the Ger. educational reformers, emphasised the need for systematic physical training. It was not till the end of the nineteenth century that G. were regarded in England as more than recreation, and at present the larger public schools and univs. are supplied with elaborate gymnasia, and even the children in the council schools are taught simple gymnastic exercises. In Sweden, Denmark, Switzerland, Italy, and Russia systems are more or less distinct and enjoy a wide popularity. The Swedish system so greatly in vogue to-day was instituted by Pehr Henrik Ling (1776–1839) early in the nineteenth century for the Swedish children in school. By the end of the century it was recognised by adults also, and in a short time it was widely practised throughout athletic Europe, entering even into military training. The rhythmic method of G., founded by Emile Jacques-Dalcroze (q.v.) and known as Eurhythmy, was a development of the twentieth century, and though it enters into the curriculum of many trained gymnasts, it is more correctly looked upon as a mode of dancing. See C. A. Forbes, *Greek Physical Education*, 1929; N. E. Gardner, *Athletics of the Ancient World*, 1930; A. J. Butler, *Sport in Classic Times*, 1930; also C. A. Westerblud, *Ling, the Founder of Swedish Gymnastics*, 1909, and E. Jacques-Dalcroze, *Eurhythmy*, 1930.

Gymnosophists (Gk. γυμνός, naked, σοφίστης, sages) was the name given by the Gks. to those Hindu philosophers who practised the most rigorous asceticism, regarding food and clothing as hindrances to purity of thought. They often lived as hermits in forests, and some, like Kalanu,

even burned themselves to death to enter a state of purer being.

Gymnophiona. group of amphibians found in the E., in tropical Africa, and in central and S. America, and also sometimes known as Coecilia. The characteristic feature is that the limbs have almost totally disappeared, with the result that the G. resemble worms. Also, the archaic skeletal axis, the notochord, is largely persistent.

Gymnosperms (plants with naked seeds), one of the two divs. of phanerogams or flowering plants. It differs from the other group, the angiosperms, in the fact that there is no closed ovary in the female flower at the time of pollination. When this process takes place the cone scales are separated from one another sufficiently to leave an open passage down to the ovules, and it is upon the micropyle of the ovule itself that the pollen falls. Thus there is no need for a stigma and style. After pollination the scales close up so as to shelter the developing seeds, opening again when the latter are ripe, so as to allow them to escape. The flowers are all unisexual, and are generally without a



GYMNOSPERMS

A, Twig of fir-tree bearing a young female cone;
B, Ovaliferous scale from A showing two ovules on the under surface (S).

perianth. The plants of this class are all perennial trees and shrubs, for the most part evergreen; they are classified into three families, Cycadaceæ, Coniferae, and Gnetaeæ.

Gympie, tn. of Queensland, Australia, 107 m. N. by W. of Brisbane. In the dist. gold, copper, silver, and antimony are mined. There is also dairy farming, agriculture, cattle and pig raising, and timber production. It is connected to Brisbane by rail and road. Pop. 8600.

Gynæcology (Gk. γυνή, woman; ἕγειν, a discourse) is the study of diseases of women, and is particularly concerned with diseases of the urinary and genital organs. At the beginning of the nineteenth century it was realised that this study was sufficiently extensive to constitute a special branch of medicine, and the gynaecologist specialises in the investigation and treatment of such diseases. G. is concerned with the structure and functions of the organs of the urogenital system; with the symptoms and possible causes of interference with the normal

working of these organs; and with the prevention and cure of disorders affecting them. The chief disorders are those due to malformation, displacement, and disease. Malformation of the organs of reproduction may be due to arrested development, resulting in the absence of certain organs or in their failure to develop to their normal size, or it may be caused by faulty development or the growth of organs characteristic of both sexes. Most malformations cannot be rectified, but displacements are usually due to difficult childbirth or to undue strain during pregnancy, and operations are sometimes necessary to rectify them. Minor operations were performed in the sixteenth century, sometimes by men who were experienced in cattle-breeding. The first recorded operation seems to have been that of Jacob Nufer, a sow-gelder, who in 1500 successfully performed a Cæsarean section on his wife. This marked the beginning of operative G., and later in the century a comparatively large number of other Cæsarean operations were recorded. The "first" book on operative G., as the term is now understood, was pub. in Holland in the seventeenth century by Hendrik van Ittenhuyze, and in the latter half of this century operative G. became estab. as a specialised branch of G. Ephraim McDowell and James Marion Sims have been described as the founders of operative G. Working in the S. states of N. America, in the latter half of the eighteenth century, these two men successfully performed various operations on the genital organs, and marvellous progress has since been made in gynaecological surgery. McDowell performed the first ovariotomy (drainage of a cyst in the ovary) in 1809; Sims is chiefly remembered for his duck-billed speculum used in examinations of the vagina. In Britain two of the greatest names in G. are those of Wm. Hunter (1718-83), who investigated the anatomy of the gravid uterus, and Wm. Smellie (1697-1763), who perfected the obstetrical forceps already invented by Peter Chamberlen (1601-83). There are many different diseases of the urogenital systems and some are highly contagious. Prevention and cure of venereal diseases are particularly important, for they may infect the infant before or during birth. Malignant growths may be formed on the reproductive organs, and seem to be more liable to occur at the climacteric or 'change of life,' when menstruation ceases. Nervous disorders also frequently accompany the bodily changes that take place at this period, and medical advice may then be very helpful. Especial care may also be necessary during puberty in the estab. of regular menstruation and the prevention of anaemia. Psychological factors are frequently responsible for many female ailments, and if there be no apparent physiological reason for the ailment the gynaecologist may recommend psychological treatment. See T. W. Eden and

C. Lockyer, *A New System of Gynaecology*, 1927; C. Berkeley (editor), *Diseases of Women*, 1924; J. Bland-Sutton, *Diseases of Women*, 1927; H. S. Crossen, *Diseases of Women*, 1927; and W. Shaw, *A Textbook of Gynaecology* (5th ed., revised Oct. 1948).

Gyndes, anct. riv. of Assyria. It has been identified with various modern rives, among them the Diala and the Mendeli.

Gyoma, vil. situated in the prov. of Békés, on the Körös, Hungary. Pop. about 12,000.

Gyöngyös, tn. in the co. of Heves, Hungary. This tn. possesses a Franciscan monastery, and trades in dairy produce and wine. Pop. over 19,000.

Győr (formerly Raab), cap. of Raab co., Hungary, on the R. Raab, 65 m. W.N.W. of Budapest. It has some well-built public edifices, and manuf. oil, agric. instruments, and machinery. This tn., which was built on the site of the Rom. tn. of Arrabona, was originally a fortress. Pop. 51,000.

Gyp, pseudonym of Sybille Gabrielle Marie Antoinette Riquetti de Mirabeau, Comtesse de Martel de Janville (1849-1932), Fr. novelist, b. at the château of Coëtsal in the Morbihan. She began by writing stories for the *Figaro* and the *Le Parisienne*, but afterwards pub. numerous other novels in which she describes the society of Paris. In 1882 *Petit Bob* appeared; in 1883 *Autour du mariage*, which has run through over ninety eds. Other works are *L'Éducation d'un prince* (1890), *Mariage civil* (1892); *Bijou* (1896); *La Bonne Fortune de Toto* (1897); *Le Journal d'un cochon de pessimiste* (1918); *Souvenirs d'une petite fille* (1927-28); and *Du temps des chevaux et des chevaux* (1929).

Gypaetus, genus of birds of the subfamily Gypetinae, family Falconidae. They are birds of prey, and are natives of the mt. regions of Africa and Asia, also some parts of Europe. Among them may be mentioned *G. barbatus* (Hammereyer).

Gypogenerus, see SECRETARY BIRD.

Gypsies, or Gipsies, wandering race scattered over the world, and found throughout Europe, in W. Asia and Siberia, Egypt, N. Africa, America, and Australia. It is impossible to estimate their numbers exactly. Their total number in Europe is probably over 900,000. They are in greatest numbers in Hungary, Rumania, and Turkey. The figures for Hungary have been given as 280,000 in 1910, falling to 18,660 (or 0.2 per cent of the pop.) in 1941, for Rumania as 278,793 in 1930, for European Turkey 117,000 (in 1903), and for Asiatic Turkey about 80,000. Austria has over 16,000, and France and Germany a negligible number. For the Brit. Isles it is estimated that there are some 12,000 G., but there are no reliable estimates later than 1931. It would be mere guesswork to state how many thousands of these nomads are settled or are wandering in America, Africa, and Australia.

The word gypsy is a corruption of Egyptian, and is found in different forms throughout Europe: *Gypenae* in the

Netherlands; *Aegyptier* in Germany (sixteenth century); *Gitanos* in Spain; and *Gyphios* in modern Greece. The name no doubt arose from the tale which they spread on their first appearance in Europe, that, for refusing to apostatise, they had been driven by the Saracens out of 'Little Egypt,' by some supposed to be a confusion between Little Armenia and Egypt, and by others identified with Epirus. The other name of the G. is *Atzigan*, or *Atsingan* derived, according to Miklosich, from the *Athinganoi* ('not to be touched'), a heretical sect formerly inhabiting parts of Asia Minor. This name appears in Rumania under the form of *Tzigan*, in Turkey *Tshingian*, in Hungary *Cigany*, in Germany *siegeuer*, in Italy *cingari*, and in Spain *zincati*. G. have also been known as *Faraon* and *Phárao-Nephka*, again indicating their supposed Egyptian origin, *Heydens* or *Heidens* ('heathens'), Saracens, Bohemians, and Tartars. They have also been called Gks., Gers., Flemings, etc., apparently from the country from which they happened to have come last. The G. call themselves *Rom* (feminine *Romni*), which may be derived from *Droma*, Indian, or more likely from *Romanoi*, the name applied to themselves by the Byzantines of the Greco-Roman Empire.

The Athinganoi mentioned above were magicians, soothsayers, and serpent charmers who lived in Asia Minor as early as A.D. 810. According to one tradition they were the descendants of Samer, an outcast, since he fashioned the Golden Calf for the Israelites in the desert. The G. cannot definitely be identified with these Athinganoi, but it is known that G. passed into Europe from the further side of the Bosphorus in the early fourteenth century, and traces of people with peculiarities not unlike those of the G. may be found in E. Europe and Asia Minor prior to that century. In the rhymed paraphrase of the Genesis, written before 1122 (ed. Ditinar, 1862), there is a passage referring to the 'Ishmaelitish folk,' descended from Hagar's son. The writer calls them *Chaltsimide* ('iron-workers'), and says of them: 'They have neither house nor country; every place is the same to them. They roam about the land, and abuse the people by their knaveries. It is thus they deceive folk, robbing no one openly.' It is certain that as early as the tenth century there were itinerant smiths or tinkers, who sold their wares in many countries. The *Komodromot* ('village roammers') mentioned by Theophanes as halting from Italy in 554 were probably smiths of the same order of the Chaltsimide. Even if G. may not with certainty be identified with these vagrant pedlars, it is extremely probable that they assimilated them in large numbers. *Atthikan*, 'sorcerers and famous rogues,' lived at Constantinople about 1050, and an unnamed race, who 'wander like a cursed people' and dwell in 'little, oblong, black, low tents, like those of the Arabs,' are mentioned in Friar Simon's *Itinerarium* as living in Crete in 1322. It is certain that G. existed in Corfu before 1326, and

twenty years later they were reduced to a state of serfdom by the Empress Catherine de Valois. There can be no doubt that by the fifteenth century they had been settled for a long time in the Balkan Peninsula and in many of the countries N. of the Danube. They had possibly already made their way further W., but there is no very good authority for their appearance in W. Europe before the beginning of the fifteenth century. In 1414 a troupe of G. is said to have arrived in Hesse. In 1417 a large company of them, bearing letters of protection from the Emperor Sigismund, who declared that they were Christian penitents engaged on a seven years' pilgrimage, were well received by various W. tns. Some had reached Hamburg, Wismar, and Lübeck in 1417; others arrived in Switzerland, Leipzig, and Frankfurt-on-the-Main in 1418; they entered Bologna on their way to Rome in 1422, and reached Paris in 1427. In 1423 a second immigration followed, led by Ladislaus, *Wójwode* ('count') of the Cigani, who also was furnished with letters of protection by Sigismund, and who appears to have hailed from Hungary. Between 1438 and 1512 the G. came in hordes, swarming over Germany, Italy, and France. They probably reached England and Scotland about 1500. The exodus of the G. from Rumelia and the E. countries is generally accounted for by incursions of Turks who subdued the kingdoms of Greece, Serbia, and Bulgaria. *The Constitutions of Catalonia* (1512) speaks of the G. as Gks., which shows that they continued for a time to live in Greece under Turkish rule. The most nomadic of the tribes probably first moved to Wallachia and Transylvania, and then, as others followed in ever-increasing numbers, moved further and further westwards.

From the earliest description of G., it is evident that they then possessed those peculiarities of physique and mode of life which distinguish them to-day. The G. who settled in Germany in 1417 are described by Krantz in his *Saxonia* and subsequently by Münster in *Cosmographia*. Most of them bivouacked in the fields, while their count and knights sometimes put up for the night in an inn. Some of them rode on horseback, others following on foot, while the women and children travelled in wagons. They had no honest means of livelihood, but practised palmistry and fortune-telling, and before very long became notorious for dishonest dealings and for theft. In appearance they were described as being black and dirty. At first they were well received if not welcomed by the chief tns. of Europe. At Utrecht, in 1429, they were given pots of ale, bread, and hundred herrings, probably because they had a 'written permission from the pope to visit the Christian land,' and in the following year twenty schillings were paid from the public purse of Middelburg to a count of 'Litill Egypt.' In 1505 James IV. of Scotland gave Antonius Gaginus, a count of Little Egypt, letters of recommendation to the king of Denmark. They were

entertained by the earl of Surrey in Ten-dring Hall, Suffolk, in 1519, and were given 'two towers for their residence' by Sir Wm. St. Clair, whom they had delighted by their dancing and acting. But before very long their popularity had waned. Middelburg, which had previously given generous hospitality to the wandering strangers, in 1460 sent Constantine, count of Egypt, a bribe of ten schellings that his troupe might not visit the town. Country folk had been gulled by these wily insinuating visitors, and small farmers and owners of barns looked forward with dread to any repetition of their



John H. Stone

A GYPNY CAMP IN ENGLAND

visits. In 1560 an ordinance of the states of Orleans enjoined all Bohemians or Egyptians to quit the kingdom under pain of death, and similar edicts had been and continued to be issued in many European countries. At Durham, in 1592, five men were hanged 'for being Egyptians,' and at Edinburgh, in 1611, four met with the same punishment 'for abiding within the kingdome, they being Egyptians.' In Hungary and Germany G. were racked and tortured as late as the eighteenth century. They were also accused of definite malpractices and crimes, often without any foundation. As early as 1424 they were thought to be emissaries of the Turks, probably on account of their dark, foreign faces and strange tongue. Certainly they were used as spies by Frederick the Great. But far more dreadful crimes than treachery and

stealing were attributed, most unjustly, to the G. In 1692 four Estremadura G. were taken captive, and under the torture of the Inquisition confessed that they had devoured a friar, a pilgrim, and a woman of their own race, and were in consequence put to a painful death. The charge of cannibalism was first made in 1547. In Hungary, in 1782, forty-five G. were hanged, drawn, and quartered on a charge of having eaten the victim of a supposed murder. The case was subsequently inquired into and the charge was proved false, for there had been no murder. Since the beginning of the seventeenth century G. have frequently been charged with kidnapping children, and many lurid tales have been told and written on the subject. In 1872 forty-seven G. were imprisoned in Germany for child-stealing, but the charge was afterwards proved false. G. have frequently been deported from one country to another, as from Scotland to the Barbados, and other Amer. colonies in 1665 and 1715, and from the Basque country to N. Africa in 1802. Even in the twentieth century Ger. legislation has been busy with the gypsy problem. In Rumania and E. Europe a certain class of G. called *Robi* were deprived of their liberty, bought, sold, and exchanged, and treated as slaves. They were granted freedom in Hungary and Transylvania between the years 1781 and 1782, and in Moldavia in 1856. The Empress Maria Theresa interested herself on their behalf, and ordered those G. in her states to be instructed in agriculture with a view to their permanent settlement. A great improvement became evident in their character and bearing, and in 1866 they were declared Rumanian citizens with full political rights. The G. of Bulgaria have not enjoyed similar privileges and in 1906 held a congress at Sofia, protesting against their political status and demanding their recognition as citizens.

G. from the beginning of their hist. have shown great versatility in turning their hands to any kind of work. In Rumania and Turkey a large proportion of the settled nationalised G. are brick-layers. In Hungary and Transylvania many of them follow some regular trade and have fixed habitations. They wash gold from the sand of the rives., and they work iron or copper; some are horse-dealers, others are carpenters and turners, and some even keep wine-shops or public-houses. In England they are generally thought of as hawkers, tinkers, knife-grinders, showmen, and basket-weavers. The nomadic G. still carry on the traditional craft of metal-work, while some make sieves and traps. They also cast bells, the church bell (1726) of Edzell in Forfarshire being their work. In Scotland they were engaged during the eighteenth century on pewter, copper, and lead work, and also executed some engravings and paintings in somewhat primitive fashion. They were also known by the bullets and cannons they fashioned in Hungary, and had an iron-foundry at Little Carron in Scotland. They make

excellent farriers and good horse-dealers. They are far-famed for their musical talent. The gypsy musicians, it is thought, originally belonged to the serf class, and were kept within the precincts of courts and palaces to provide entertainment. The women were regarded as particularly graceful dancers, and danced to the accompaniment of the fiddle. In 1530 we hear that they 'dansit before the king in Holyroodhouse' in Scotland. They won a high reputation in Wales as harpists, and in Hungary as fiddlers. In fact, Liszt declared, though his theory has been hotly disputed, that the Hungarian national music originated in them. G. show special talent in singing or reciting old ballads and folk-songs, often to the accompaniment of the guitar. They have too a great aptitude for telling fairy stories. These tales do not appear to belong to their own tribe, but to have been picked up in the various countries which they have visited, and are passed on by word of mouth from one generation to another. In this connection their extraordinary gift of speaking in foreign languages may be mentioned. The gypsy women are famous fortunetellers. They seldom repeat their charms and incantations in their own tongue, but in Gk. or Rumanian in a Romanised dialect. They tell fortunes not only by palmistry but by playing-cards. They use the Tarock, a special set of cards, each card having a mystical meaning of its own, the secret of which they keep within their own tribes. It is quite possible that playing-cards were first brought into Europe by the G., and were originally only used for telling fortunes and for lotteries, later being employed for games and gambling. G. were formerly despised for their looks, the writers probably being unable to recognise their undoubted beauties behind the dirt. They are dark-skinned, with dark, lustrous eyes, thick dark hair, often coarse and frizzled, and gleaming white teeth. They show off their darkness by wearing bright oriental colours. The women bind their hair with gaudy silk handkerchiefs, and show an inordinate love of jewellery. Though paying great attention to their clothes, they are at the same time shabbily and untidily dressed, and are slovenly in their habits. Their great moral defects are probably due to the vagrant life the race has lived from its beginning. G. as a whole have no sense of responsibility, and have not the same sense of honour as other European races. They are not religious by nature, but frequently adopt the prevailing religion of the country in which they travel. Many of them still retain old superstitions, probably the remnants of a religion they have lost. Some of these superstitions, such as the worship of trees and serpents, may be found in their folk-tales and songs. G. seldom go to church, except to baptise their infants, to marry, and to bury their dead. They are fatalists, and have the philosophy of the open high-road. To their friends they are loving and lovable, and generous to excess.

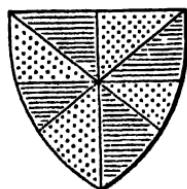
Language.—*Romanī tib* ('gypsy lan-

guage') is the same language all over the world, though the dialectical differences from country to country are so great that, for instance, an Eng. gypsy would have great difficulty in understanding a Gk. gypsy, and possibly could not understand him at all.

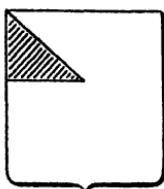
The researches of Ruediger (1782) and Grellmann (1783) in Germany, and of Marsden (1783) in England, proved that the language of the G. was unmistakably connected with some Indian language. Some of the words in Romani, however, have a more archaic form than those of modern Indian dialects. The speech of the Armenian Gypsy shows more resemblance to Sanskrit than does the speech of the European (Gypsy), and the speech of the Asiatic (or Syrian) Gypsy is peculiar in itself, and entirely different from any other dialect. These facts have led scholars to think that the G. originally came from India, and that there must have been various great movements. The route taken can be determined in part from the elements other than Indian present in Romani vocabulary, and even more so from the phonetic changes in the development of the Romani dialects. The question in which Indian sub-branch Romani had its origin, has been much discussed, and is still an open problem. It is, however, generally agreed that it originated in N.W. India. Separated from the other members of the Indian family, original Romani has developed upon lines of its own. Some of its most important and characteristic features have been developed outside India, firstly in Persia, where, according to Prof. Sampson (1926), the G., perhaps about the tenth century A.D., have split into two separate bands, one travelling N. by way of Armenia and becoming the ancestors of the Bosha and of the European G.; and the other, from whom descend the Nawar, Karachi, and Hleebis, journeying southwards into Syria, whence some of them passed into Egypt and Asia Minor. Sampson seems to be right in pointing out that this main separation took place on Persian soil; indeed, while Persian loan-words are found in the speech of both Bosha and Nawar, Armenian borrowings seem to be wholly lacking in the dialects of the latter. On the other hand, the fact that there is in Romani a large percentage of Persian words, but, according to Miklosich (1878), no Arabic element, shows that the G. could not have resided in Persia long after the Moslem conquest to have been so completely unaffected by the language of the conquerors, and that they must have made their way to Europe via Persia and not through Arabia. That is to say, the movements from the E. must have taken place long before the tenth century A.D. Important phonetic changes and additions in vocabulary arose in Byzantine Greece, in all of which the European Romani dialects differ from Armenian and Asiatic Romani. The gypsy tongue possesses more Gk. than Persian words, so that it has been suggested that their stay in Greece was more prolonged than it had been in Persia.

Some scholars have thought that they lived in Greece from very early times, but this theory cannot be accepted, for the gypsy vocabulary contains no old forms of Grk. and not even many forms of early Slavonic words.

Various developments of minor extent, due to the influence of local surroundings, appear later in individual Romani dialects, dating from the time of separation.



GYRONNY



tion within Europe itself. Mention may be made of Romani borrowings from Romanian, Slavonic (mainly Bulgarian and Serbian, but also Russian and Czech), Sp., It., Fr., Ger., Eng., and Welsh. At the present day there are at least three distinct groups of dialects, the Armenian, the Asiatic (other than Armenian), and the European; each one, and especially the last, is subdivided in numerous dialects, the existing differences being due to the adoption of words and idioms of the different peoples with which the G. have come into contact. The G. of Wales and of Turkey speak the purest Romani, and retain the oldest forms. In the majority of countries, however, Romani is being broken down by the stress of modern life. The language of Anglo-Romani shows an almost complete loss of grammatical inflections and a great part of its original vocabulary: it has thus sunk to the level of a semi-jargon by its adoption of many Eng. words, forms, and idioms. In Spain, Italy, Norway, and other countries the same process of levelling has been taking place, and in many cases the original inflections have been superseded by those in use among their neighbours. Consequently the language has deteriorated in grammar, although its vocabulary has been enriched by the adoption of foreign words. In a country like England, where attendance at the national schools is compulsory, where gypsy children are brought into daily contact with other children, and are obliged to learn and speak Eng., their assimilation with the land of their adoption must gradually take place. On the other hand we use quite a number of Romani words in our everyday speech without realising that we do. The most common of these words is *dad*, in Romani, 'father'; cf. Dardio *dado*, Ossetic *dada*, Sanskrit *dat*, Hindi, *dat*. There are about 750,000 Romani speakers in Europe (c. 300,000 in Rumania, c. 100,000 in Bulgaria, c. 50,000 in Spain and Yugoslavia). There are also a certain number of G. in the U.S.A.

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Gypsum, hydrated calcium sulphate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$), which occurs in large monoclinic crystals sometimes known as selenite. Marggraf in 1750 showed that gypsum artefactum, obtained from sulphuric acid and lime, was identical with the naturally occurring mineral. When G. is heated to 120° a hemihydrate, $2\text{CaSO}_4 \cdot \text{H}_2\text{O}$, is obtained, and on further heating the anhydrous calcium sulphate results. In this state the product is almost insoluble in water, and is identical with natural anhydrite. Another modification, soluble anhydrite, is obtained from G. by dehydration *in vacuo* over phosphoric anhydrite. When G. is heated moderately there results a product known as plaster of Paris (G. was formerly worked in Montmartre, to the N. of Paris), which, according to Le Chatelier, consists mainly of the hemihydrate above mentioned. On addition of water this dissolves in part, forming a saturated solution which is, however, supersaturated with respect to the dihydrate, $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$. Consequently some of the dissolved salt separates as G., and the solution can then dissolve more of the soluble form. By repetition of this process all the hemihydrate is converted

into G., which separates in interlacing crystals, forming a solid mass. In the original burning of the G. care must be taken that too great heat is not applied, otherwise the product refuses to take up water at all, or at least very slowly. In this state it is said to be 'dead-burnt.'

Gyration, Centre of, see CENTRE.

Gyron, in heraldry an ordinary, consisting of two straight lines, drawn from any given part of the field, and meeting in an acute angle in the fesse point. (See p. 661.)

Gyronny, in heraldry is a term applied to a field divided into gyrons or triangular parts of alternate tinctures. The shield is divided quarterly and per bend and bend sinister. (See illustration, p. 661.)

Gyroscope and **Gyrostat**, mechanical instruments used to illustrate the curious principles of rotating bodies. The ordinary form of G. (Fig. 1) consists of a heavy wheel A mounted on an axis BC, which is fixed in a ring BDCE. This ring in turn is capable of rotation about the axis DE, which is fixed in another ring also capable of rotation about the axis FG. The instrument is supported by a heavy stand. The whole is arranged so that the three axes of rotation in any position pass through a fixed point, which is the centre of gravity of the wheel. The wheel is thus

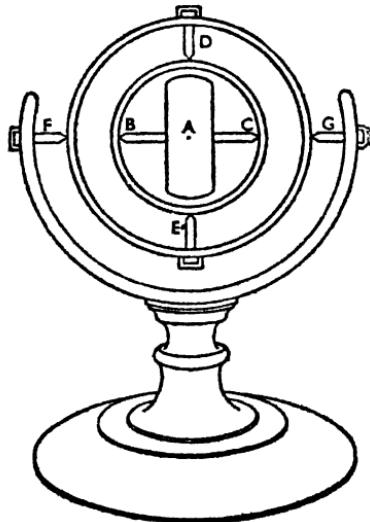


FIG. 1

GYROSCOPE. ESSENTIAL MECHANISM

capable of rotation about three mutually perpendicular axes and its axis may thus take up any direction. If the wheel is rotated rapidly it is found that a very considerable push is required to change the direction of the axis of rotation. In the absence of any external forces, the rotating axis will preserve a fixed direction in space. This was used originally by

Foucault to prove the rotation of the earth. Thus if the axis is initially pointed to some star and the wheel kept rotating rapidly, the axis will remain pointing at the star irrespective of the earth's rotation. Thus it will appear to an observer to turn about an axis parallel to the axis of the earth, and follow the star as it rises and sets. It is on this principle that the G.

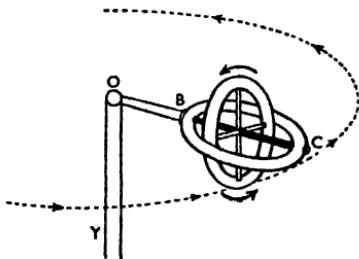


FIG. 2
TRICK AROUND A VERTICAL AXIS

compass is made. So long as the rotation of the wheel can be kept up, the axis, if originally pointed to the pole star, will remain in that direction. By means of a rapidly rotating wheel a telescope stand has been constructed which will remain fixed irrespective of the motion of a ship. Perhaps the most important practical application of the theory is seen in the torpedo. It is of immense importance that the original direction should be kept after the torpedo has been fired, and so the steering gear is connected with a G. by means of a slide valve. The wheel is set rotating very rapidly at the moment of fire, and the axis of rotation remains fixed in direction. Thus if the torpedo shows any deviation in course, the connection between the rudder and the G. at once produces a steadyng effect. So long as the rotation remains very rapid, it is found that the general line of fire is accurately kept. The G. has also been applied to the mono-rail by Louis Bremann, an Eng. Inventor, the stability of the train being secured by two gyroscopic wheels revolving *in vacuo* at a high speed. A more simple form of the G. is sold as a toy. It consists of a wheel set on an axis in a ring, like the wheel A and the ring BDCE in Fig. 1. This ring is fixed on an axis in the same straight line as BC, the end of which fits into a small cup on the top of a stand provided. In Fig. 2 let O represent the cup, and let CIO be the position of the axis as it is placed in the cup after the wheel has been rapidly rotated. It is found that the whole instrument revolves about the vertical axis OY, the end C gradually dropping lower and lower as the rotation of the wheel gradually dies away. This turning about the axis OY is known as *precession*. Another motion of an oscillatory character, known as *nutation*, also exists, but this is so small as often to be hardly perceptible. The reason for pre-

cession may be seen from the following: Let $ABCD$ be a wheel rotating about an axis through O perpendicular to the plane of the paper, and also turning about the axis BD . Let any particle of mass m move in the circle from P to Q in a short time τ . Then if ω_1 is the angular velocity of the wheel, $PQ = \omega_1\tau$. If ω_2 is the angular velocity about BD , P is also moving up out of the plane of the paper with velocity $\omega_2 l' M$ when PM is the per-

pendicular to the plane of the couple. Hence in Fig. 2 the effect of the force of gravity and the support at O results in a turning about a vertical axis. Though the terms G. and gyrostat are often used for one another, the distinction usually made is that the gyroscopic flywheel rotates about an axis of which one point is fixed, whilst the gyrostat is free to move on a plane. The common model of a gyrostat consists of a flywheel enclosed in a case, slits being left for the string to set the wheel in motion. When the wheel is rotated the instrument may be placed on a table on its point (in the same straight line as the axis of the wheel) or on any point of the bearing edge (in the plane of the wheel itself), and usually consisting of a regular sixteen-sided figure. In the former case the motion is exactly that of a spinning top, which is the most simple practical form of gyrostat. Other common forms are a hoop and the two wheels of a bicycle. The general properties of a rotating wheel hold equally well for these cases. Thus the precession of a spinning top, the circular path of a hoop moving with its plane inclined to the vertical, and the turning of the handle-bars of a bicycle to preserve equilibrium, are to be explained by methods similar to that employed in Fig. 3. In the construction of an aeroplane, where the engine parts and the propeller are rotating rapidly, the gyroscopic effect has to be considered. The barrels of guns and rifles are fitted with spiral grooves to give the projectile a rapid rotation on its axis, thus tending to keep the direction of the axis unchanged. The rotation of the earth about its axis makes its action very much like that of a top suspended by a string, and corrections for precession and nutation have to be made in astronomical calculations. Many other cases may be quoted. See M. Davidson (ed.), *The Gyroscope and its Applications*, 1948.

Gythium, one of the old seaports of Greece, situated on the gulf of Lacoonia. The Spartan fleet was stationed here, and consequently during the time of the wars against Athens it suffered many vicissitudes. At the present day the larger part of it is sunk in the sea. It is now a modern seaport with a good harbour. Pop. about 5000.

Gyula, chief tn. of the co. of Békés, Hungary. It carries on a considerable trade in cattle, and manufs. spirits, wine, and oil. Pop. 22,000.

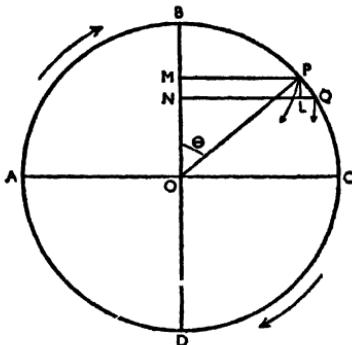


FIG. 3
CAUSES OF PRECESSION

pendicular to BD). At Q the velocity out of the plane of the paper has increased to $\omega_2 QN$, i.e. it has increased by $\omega_2 QL$. PQ may be considered a straight line since the time τ is very small, and its length is $OP \cdot \omega_1 \tau$. Hence this increase of velocity $= \omega_2 PQ \cdot \cos \theta - \omega_2 OP \cdot \omega_1 \tau \cos \theta - \omega_1 \omega_2 \tau \cdot OM$. Hence the momentum of the particle upwards out of the paper increases at the rate $m\omega_1 \omega_2 OM$, i.e. proportional to its distance from AC . It must therefore be acted upon by a force $m\omega_1 \omega_2 OM$ upwards out of the plane of the paper. Similarly particles on the arc AB are acted upon by an upward force, whilst those on AD and DC are acted upon by a similar downward force. Thus the rotation about BD is due to a couple which would turn the wheel, when not rotating, about the axis AC . Generally the effect of a couple on a rapidly spinning wheel is to produce displacement of the axis of rotation perpen-

H

H, eighth letter of the Eng. alphabet, as it was of the Semitic, Gk., Etruscan, and Lat. from which it is derived. It was formerly written **H**, and was called *heth* or *keth*. The Semites used it as a strong aspirate, which is also the modern use. The Gks., of course, borrowed it with the rest of the symbols, and early made use of it either (1) to represent a long *e* sound, *ēta*, to distinguish it from the short; or (2) for smooth and rough breathings, the latter being the aspirate, so that the aspirate *h* passed into the Rom. alphabet. Yet by 240 B.C. it was quite neglected by the common people just as it is to-day, so that Catullus pokes fun at Arius, who tried to be correct, but always succeeded in getting his aspirates in the wrong place, so that he said *hinsidias* for *insidias*, etc. In modern It. the *h* as an aspirate has quite disappeared (although it is still written in some words, like *ho*, *hanno*, and in combinations *ch*, *ph*), and it is fast becoming obsolete in Fr. Sometimes it represents other sounds; for example, the Sp. *h* is often a substitute for the Lat. *f* (*hijo*, from *filius*), but it is not pronounced. In Eng. it is not infrequently put for *c* and *s*. Thus the prefix *hyper-* corresponds to *super-*; the first syllable of *hexagon* corresponds with *six*, whilst *hundred* and *century* are real doublets. In Eng. the *h* may be anything from a strong aspirate to a cipher. Thus it is very pronounced in *history*, less so in *when*, and not at all in *hour*.

Haag, Den., see HAGUE, THE.

Haakon, or **Haco** (Old Norse *Hákon*), name of as many as seven kings of Norway.

Haakon I. (d. 961), called the Good, was the son of Harold Fairhair and was brought up as a Christian by Athelstan, king of England, but failed in his efforts to convert his own people from their pagan rites. His foster-father gave him ships in 933, and he sailed home and was soon proclaimed king. The sons of Erik, Haakon's half-brother, were constantly rebelling, but he came off victor.

Haakon IV. (1204-63), called the Old, put to death Earl Skule in 1239, as the latter had become the centre of intrigue. He is said to have added Iceland and Greenland to his kingdom. But his defeat at Largs in 1263 by Alexander III. lost him the Hebrides. Compelled to put to sea again he wintered in the Orkneys, where he d.

Haakon V., or **Haakon Longlegs** (reigned 1299-1319), was the son of Magnus Lagabæt (law reformer), and became king after Eric, his brother (and father of the 'Maid of Norway'). He was the last male descendant of his line. His daughter, Ingeborg, was married to Duke Erik (1312), who was starved to death by his father, King Birger of Sweden.

Haakon VII. (b. 1872), present king of Norway, was a Dan. prince, Charles, second son of Frederick VIII. of Denmark. He married Maud, the youngest daughter of Edward VII. of England; and his only son, Prince Olaf, was b. in 1903. In 1905 Norway separated from Sweden, and in the following year Prince Charles took the anc. name of Haakon and was crowned king. When Germany invaded Norway in April 1940 H. led the heroic resistance of the Norwegian Army, supported by the Brit. and Fr. allies. He rejected Hitler's demands for surrender, and showed great courage under Ger. air attacks. Came to Britain in June 1940, after the allied forces abandoned N. Norway, and returned to Norway on the cessation of hostilities.

Haarlem, chief tn. of the prov. of N. Holland in the Netherlands, is 11 m. distant from Amsterdam. It has a through communication to Zandvoort, Leyden, Amsterdam, and Alkmaar by means of electric and steam trams and railways. It presents the appearance of a typical Dutch city, with its long, narrow canals and gable-roofed houses. The prin. buildings are situated in the market-place, which is a large space in the centre of the city; here are to be found the *Fleshers' Hall* (built in 1603 and containing the archives), the tn. hall, the *Stadsdoelen*, and the *Groot Kerk*, or Great Church, dedicated to St. Bavo, dating from the close of the fifteenth century. This church has a famous organ consisting of four keyboards, sixty-four registers, and 5000 pipes, and constructed by Christian Muller. The statue of L. Koster, the founder of the movable printing type, stands in the market-place. Cotton manuf., dyeing, printing, and typefounding form the chief industries of H. The city carries on an extensive horticultural trade, rearing the celebrated Dutch bulb, especially the hyacinth and tulip. H. has played no inconsiderable part in the hist. of Holland; it took part in the revolt of the Netherlands against the Sp. tyranny in 1572, and was forced to submit to Alva's son, Frederick, in 1573; it owed its final deliverance to William of Orange, who rescued it in 1577. H. is the bp. of the celebrated Dutch painters Ostade, Berchem, Ruysdael, and Vander Heist. In Ger. occupation from 1940 to 1944, when it was liberated by the Canadian Army. Pop. 155,700.

Haarlem Lake, or **Haarlemmer Meer**, in the prov. of N. Holland in the Netherlands, a triangular-shaped expanse of now fertile land reclaimed by dint of unremitting industry in 1840-53 from a sheet of water formed by the great inundation of the sixteenth century. It lies between Amsterdam, Haarlem, and Leyden, and has an area of about 72 sq. m. It

communicates through the R. Y with the Zuider Zee.

Hababli, see HILLIEN.

Habakkuk, one of the twelve minor prophets of the O.T. Nothing is known of him historically, although legend, as embodied in such works as *The Lives of the Prophets*, has much to say of him. The book bearing his name can be separated into two distinct parts at the end of the second chapter. The third chapter is a psalm ascribed to the prophet II, but which internal evidence shows to be certainly post-exilic. Its text is somewhat corrupt, but not so much so as is that of the first two chapters. In each division valuable emendations have been made by Wellhausen. The problem of the earlier chapters is more difficult. The book opens with a lament to Jehovah (or Yahweh) asking why the iniquity of the wicked is suffered to continue (vv. 2-4), and the prophet receives an answer that Yahweh is about to raise up the Chaldeans as an instrument of vengeance. Then follows another complaint (vv. 12-17) and in chap. II. 2 comes Yahweh's answer. Then follows the song of triumph of the nations over their oppressor. Many critics hold that the world-power over which the nations should exult is Assyria, and that the difficulties which arise in this interpretation are due to the editors of the fifth or fourth century B.C. Others have held that the prophecy was primarily directed against the Chaldeans themselves. The date of the original composition was towards the end of the seventh century B.C. (c. 615). See commentaries by Delitzsch, Davidson, Nowack, and Driver (*Old Testament Literature*, 1897).

Habberton, John (1842-1921), Amer. author, b. at Brooklyn. He was successively printer, soldier, merchant, and journalist. From 1865 to 1872 he was connected with Harper Brothers; he was on the editorial staff of the *New York Herald* in 1877. His most popular work was *Helen's Babies* (1876). He also wrote *The Jericho Road* (1877); *Dragon Crankett* (a play, 1880); *All He Knew* (1890); *The Tiger and the Insect* (1902); *Other People's Children* (new ed., 1903); *Life of George Washington* (1881); and *Some Boys' Doings* (1901).

Habeas Corpus, in law, a writ directed to a person having custody of a prisoner commanding him to produce the body (*habeas corpus*) of the prisoner before the court, with a statement of the day and cause of his detention. The personal liberty of the subject has ever in England been the subject of jealous regard, and as early as Magna Charta the principle underlying the writ of H. C. was solemnly enacted. Up to 1679 the constantly recurring acts of repression in the name of the king, notably in the time of the Star Chamber, demonstrated the need for a far more stringent system of procedure. The Petition of Right explicitly demanded that in future the orders of the sovereign should not be sufficient ground for incarcerating his subjects. But after the historic arrest of Jemps in 1678, when the judges decided that a change of prison quarters fully

exonerated the prison governor from all liability for failure to produce the prisoner, the famous *Habeas Corpus Act* of 1679 was passed to meet the new difficulty. Briefly, the Act provides: (1) That a writ of H. C. may be claimed by any prisoner except one committed for treason or felony, the writ to be returnable immediately before the judge granting it with a statement of the cause of the commitment; (2) prisoners committed for treason or felony are to be brought up for trial at the next ensuing assizes, unless the Crown witness cannot be produced so soon; (3) heavy penalties for shifting the custody of the prisoner from one prison to another without sufficient reason or authority, or for neglecting to give the prisoner a true copy of the warrant of commitment; (4) penalties of £500 for sending persons to prison beyond the seas or re-committing them after delivery by H. C. The flaws in this Act were that there were no safeguards against (a) excessive bail, (b) a false return, or (c) illegal civil detention. The Bill of Rights remedied (a), and an Act passed in 1816 extended the Act of 1679 to cases of civil detention, and remedied (b) by empowering the judges themselves to examine the truth of the return. The *Habeas Corpus Act* of 1679 has occasionally been suspended in times of rebellion and civil commotion, e.g. during the Jacobite rebellions of 1715 and 1745 and the agitations excited out of sympathy for the Fr. revolutionaries at the end of the eighteenth century. The writ has been used before now to restrain the rights of a parent over a child, and of a guardian over his ward; and again, the mother of an illegitimate child can claim the custody of such a child as against the reputed father by suing out a writ of H. C. On the person detained being produced before a judge the latter has three courses open to him. He may either make no order at all, discharge the prisoner, or release him on bail.

In the U.S.A. the Federal and state legislatures have founded their procedure on the Act of 1679. The U.S. constitution provides that 'the privilege of the writ of habeas corpus shall not be suspended unless when, in cases of rebellion or invasion, the public safety may require it.' This question has caused discussion as to whether the right of suspension is vested in the President or in Congress; and some difficulties are caused by the conflict of state and federal courts with regard to the right to issue a H. C.

Haber-Bosch Process, see under HABER, FRITZ.

Haber, Fritz (1868-1934), Ger. chemist, b. of Jewish parents, at Breslau. Studied at Berlin and Heidelberg, and became prof. of chem. at the Kaiser-Wilhelm Institute for Physical Chem. (1911). His pub. works on electro-chemistry and the thermodynamics of gas reactions, and in 1908 produced ammonia synthetically. He is chiefly remembered for his researches, with Karl Bosch (1874-1940), industrial chemist, which resulted in a process, called the Haber-Bosch process, of synthesising ammonia from hydrogen and the nitrogen

of the air. These researches kept Germany supplied with nitrates for explosives and agric. purposes during the First World War when Chilean supplies were cut off. He was awarded the Nobel prize for chem. for 1918 (1919). As a protest against anti-Sonite legislation by the Nazi Gov. he resigned the directorship of the Kaiser-Wilhelm Institute and his chair at Berlin Univ. Later he lived at Cambridge, where he was given laboratory facilities by Prof. Win. Pope.

Habibullah Khan (1871–1919), amir of Afghanistan, son of Abdur Rahman; assassinated in 1919. He succeeded his father in 1901. Renewed the arrangement with Great Britain by which the control of foreign relations was delegated to the Brit. Gov. in consideration of protection being given by the latter to the amir in the event of unprovoked aggression. He continued a loyal friend of Great Britain in spite of blandishments in the shape of Ger. gold and seductive promises, and held out against Ger. emissaries during the First World War. That his assassination was followed by a rising in Afghanistan and intrigues between the new amir and the Mus. Sov. (1919) is some evidence of the recognition that his loyalty would end only with his death. He was a polyglot of some attainments, and was so far an occidental in taste that he played golf and followed horse-racing, insisted on his courtiers wearing European dress, and limited his wives to three.

Habington, Edward Thomas, see ABINGTON.

Habington, William (1603–54), Eng. poet, b. at Hendlip, in Worcestershire. He belonged to a Catholic family, and his father and uncle were both implicated in Babington's plot. Having resisted the pressure brought to bear upon him to become a Jesuit, he went to Paris and married Lucy Herbert, daughter of the first Lord Powys, whom he immortalised in *Castara* (1634), a vol. of lyrical poems, some of which are of great sweetness and marked by unusual purity. He also wrote *Histories of Edward the Fourth* (1610); *The Queen of Arragon* (1640), a tragic-comedy; and *Observations upon Histories* (1641).

Habit, in physiology. It is well known that every time a certain stimulus gives rise to a specific reflex, the response to the stimulus comes more easily, so that if the cycle is repeated often enough it becomes automatic, and even unconscious, and thus a H. is formed. When any nerve ending is stimulated an impulse passes along its specific nerve fibre until the spinal cord is reached. In the cord there is a choice of sev. paths up to the brain, or directly to the nerve fibres passing out of the cord (see diagram). It is not known what makes the impulse take one of these courses more than another for the first time. The direction must depend upon conditions of tension and of block existing at the moment in the nervous system. But once a stimulus has travelled along a certain path, it becomes the easiest path, and will always be used unless there is a block in the path from some other cause. The process is often, and very fairly,

compared to the making of ruts in a road. Modern psychologists are agreed that it is primarily due to the physical properties of the matter of which the nervous system is composed. A H. is thus a conditioned

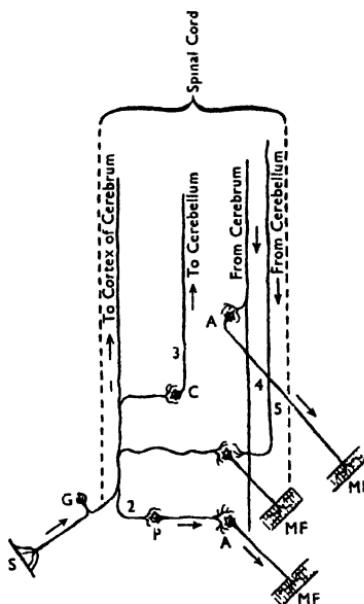


DIAGRAM TO ILLUSTRATE SOME OF THE PATHS THAT A STIMULUS TO AN AFFERENT NERVE MAY TAKE

S, Surface at which sensory impulse is received; G, cell of posterior root ganglion; P, cell of posterior horn; C, cell of Clarke's column; A, cell of anterior horn; MF, muscle fibre.

1, Fibre of posterior columns; 2, fibre of coma tract; 3, fibre of tract of Flechsig; 4, fibre of pyramidal tract; 5, fibre of tract of Loewenthal.

reflex action, or a series of such actions. Most H.s., e.g. walking, swimming, cycling, etc., are complex, and involve the co-ordination of various groups of muscles. In fact the growth of a H., in the physiological sense, can be very well seen in the baby feeling its feet and learning to walk, or in a boy learning to swim. Actions which at first occupy the whole attention, which are laborious, irregular, and varied, become more and more uniform, and less and less conscious, until they can be continued for long stretches of time without any effort of the will. Persons with a neurotic temperament contract H.s. far more readily than lethargic individuals. It is this fact that explains *H. spasms*, the well-known tics. The movement of the tic is at the first the reflex to an irritation, such as ill-fitting, uncomfortable clothes, some irritation of the eyes, etc., but owing

to the peculiarly irritable state of the nervous system at the time the action rapidly gets beyond the control of the will. Alcoholism and drug Hs. can be explained in the same way. The law of H. applies equally to mental and bodily functions, and is of vital importance to educationists, for education may be described as the development of Hs. The greater the number of mental processes reduced to the realm of H., the more is the brain set free for further thought, so that the aim of the educationist is to create good Hs. and many.

Habit and Repute, in Scots law, a phrase indicating the inference of a legal relationship or fact of which the law takes cognisance from the general belief that such relationship exists or that such event has happened. It is especially applicable to the presumption of marriage from evidence of general reputation as husband and wife coupled with cohabitation. Erskine states that the repute in such a case must be that of substantially all who have an interest to inquire. The term also has a special significance in regard to the condition of a person accused of theft.

Habitual Drunkards, see DRUNKINNESS.

Habsburg, see HAPSBURG.

Hacha, Emil (1872-1945), Czech politician, president, and lawyer, b. at Trhové Sušiny, Bohemia. After practising as an advocate he became president of the Czechoslovak supreme administration court (1925) and, in 1938, when Benes resigned following the Munich agreement (q.v. and see also CZECHOSLOVAKIA), he was elected to succeed him. Tried in vain to maintain the independence of the State after the loss of the Sudetenland and consequential Ger. demands, and on March 11, 1939, when the Ger. forces were marching into the country, he was summoned by Hitler to Berlin where, under duress, he signed a declaration placing his country under Ger. 'protection.' H. was left nominally in office, but really as a 'puppet' 'State president' of the 'Protectorate of Bohemia and Moravia,' and appears very soon to have urged his fellow countrymen to throw in their lot with their new masters. In spite of his denunciations of Dr. Benes (q.v.) the people, throughout the occupation, continued to look upon the latter as their leader, and remained as bitterly hostile to the Ger. as at the end as in the beginning. It was decided by law by the exiled Czech Gov. that special national courts should be constituted to try guilty Czechs and Slovaks, particularly members of the H. Gov. in the Czech lands (and of the Tiso Gov. in Slovakia). But H. did not long survive the liberation of Czechoslovakia, dying in imprisonment June 27, 1945.

Hachette, Jean Nicolas Pierre (1769-1834), Fr. mathematician, b. at Mézières, and educated at the college of Rethel. Through the influence of Gaspard Monge he obtained the post of assistant prof. in the newly-estab. Ecole Polytechnique (1794), becoming prof. of descriptive geometry in 1797. In 1816 he lost his chair on the accession of Louis XVIII., and

failed to obtain election to the Académie des Sciences owing to royal opposition until after the revolution in 1831. His chief works are *Deux Suppléments à la géométrie descriptive de Monge* (1811); *Traité élémentaire des machines* (1811); *Éléments de géométrie à trois dimensions* (1817); *Traité de géométrie descriptive* (1822).

Hachette et Compagnie, Fr. house of publishers and booksellers, estab. in Paris in 1826 by Louis Christophe François H. (1800-64). At first the firm pub. only a series of books designed to improve the system of school instruction, especially the classics, but in 1850 they extended their pubs. to include books of almost every type, as well as magazines, a directory-guide to Paris, *Paris Hachette*, and a popular annual.

Hachinohe, tn. of Japan, situated about 49 m. S.E. of E. of Awohori. Pop. 10,000.

Hachijoji, tn. of Ilondo, Japan, 30 m. W. of Tokyo, with an extensive silk industry. Pop. 55,000.

Hackbut, see FIREARMS.

Hackel, Ernst, see HÄCKEL.

Hackensaak, tn. of New Jersey, U.S.A. and the cap. of Bergen co. It is situated on the R. H., 12 m. N. by rail of Jersey City, and 14 m. N.W. of New York, and is served by four lines of railway. It is chiefly a residential tn., but in the vicinity are many factories and silk mills. Pop. 25,000.

Hackenschmidt, Georges (b. 1878), Russian wrestler, b. at Dorpat; became an engineer in St. Petersburg (Leningrad), and in Germany. Won many victories on the Continent; came to England in 1901, and became famous as a wrestler on the music-hall stage. In 1908, at Chicago, he failed to conclude a match with Gotch, thus forfeiting world's championship.

Hackert, Philipp (1737-1807), German landscape painter, b. at Prenzlau in Prussia. About 1768 he visited Rome, and passed the rest of his life in Italy. He was commissioned by the Empress Catherine of Russia to paint six pictures of Count Orlov's naval victory over the Turks in 1770. In 1786 he was appointed painter to the King of Naples, but left Naples for Florence in 1799. His paintings, the chief merit of which consists of their close imitation of nature, include 'View of Rome,' 'Views in the Vicinity of the Villa Borghese,' and many seaports of Italy. See Goethe's memoir, *Philipp Hackert: Biographische Skizze*, 1811.

Hackländer, Friedrich Wilhelm von (1816-77), Ger. novelist and dramatist, b. at Burtscheid, near Aachen. He served an apprenticeship to business, and served for some time in the Prussian artillery, but began his literary career with *Bilder aus dem Soldatenleben im Frieden* (1841). In 1843 he became secretary to the crown prince of Württemberg. *Wachstubenabenteuer* (1845) was followed by *Bilder aus dem Soldatenleben im Kriege* (1849), the fruits of a campaign in Piedmont. A tour in Spain in 1854 resulted in *Ein Winter in Spanien* (1855), and in 1857 he founded, with Zoller, the illustrated weekly *Über Land und Meer*.

Among his novels the best are *Namenlose Geschichten* (1851); *Eugen Stillfried* (1852); *Krieg und Frieden* (1850); and his best comedies are *Der Geheime Agent* (1850) and *Magnetische Kuren* (1851). See II. Morning, *Erinnerung an F. W. Hackländer*, 1878.

Hackney, N.E. metropolitan bor. of London, 3 m. N.N.E. of St. Paul's. The bor. is in two divs. (H. and Stoke Newington, and H. S.), and includes Clapton, Homerton, Dalston, and part of Kingsland. The R. Lea flows to the E., and Victoria Park lies partly within the bor. limits. The ancient church of St. Augustine is the only important historic building. It was once a fashionable place of residence, but is now a poor dist. John Howard (d. 1790) and Daniel Defoe (d. 1731) both resided here. Pop. 180,500.

Hackney Breed, *see under HORSE*.

Hackney Carriages are carriages used for the conveyance of passengers and include motor omnibuses, charabancs, tramway cars, hansom, four-wheeled cabs, and taxi-cabs. The forerunner of the cab (*ocabriolet de place*) was the hackney coach (q.v.); the hansom cab was invented by J. A. Hansom in 1834. The first stand for H. C. appeared in 1834 near the old Maypole in the Strand. H. C. in London are regulated by a variety of statutes. Every cab must have an arm, licence from the home secretary, which is issued by the chief commissioner of police. It must have the number of persons it is licensed to carry painted on the back, and must bear a light from one hour after sunset to one hour before sunrise. See also CARS.

Hackney Coach (Fr. *haquene*, an ambling horse or mare, maintained especially for the use of ladies). From the hiring-out of hackneys the word came to be associated with letting out coaches, etc., for hire. The H. C. was a conveyance with four wheels and two horses let out for hire generally after being discarded by some owner among the nobility.

Haco, *see HAAKON*.

Haddington, royal, municipal, and police bor. and the co. tn. of E. Lothian, Scotland. It lies on the Tyne, 18 m. E. of Edinburgh. The chief building is the ruined St. Mary's Church, a cruciform decorated building in red sandstone, the nave of which is sufficiently repaired to serve as par. church. Other buildings are the co. buildings (1833), the corn exchange (1854), the tn. hall (1748-1831), and the Knox Memorial Institute (1880). Famous natives of the tn. were John Knox, John and Samuel Brown, Samuel Smiles (1816-1904). The tn. has suffered from fires in 1216 and in 1244, floods in 1775, and the great siege of the Eng. by the Scots in 1548. The chief industries are the manufs. of agric. implements, woolen goods, and sacking, and brewing and tanning. Pop. 5700.

Haddingtonshire, *see EAST LOTHIAN*.

Haddock, or *Gadus angelfinus*, species of Gadidae, a family of marine carnivorous fishes; it is found on all coasts in the N. Atlantic Ocean, and is abundant everywhere round Great Britain. There is a strong resemblance between the H. and G.

morrhua, the cod, both having three dorsal and two anal fins of an elongated form; the H. is distinguished by a black lateral line and a black spot behind each of the pectorals. The H. is also smaller, as it never exceeds a length of 3 ft., some of the largest specimens being found in Dublin Bay. Its colouring is brown, and silvery underneath, the black markings on the pectorals sometimes extending to the middle of the back; tradition ascribes the origin of these spots to the finger and thumb of St. Peter, and alleges that the H. was the fish from whose mouth he took tribute money. The H. lives largely on molluscs, and the bait used in catching it consists generally of mussels; trawlers are also employed in H. fishery. These fish are gregarious and inhabit deep waters, travelling to the coast to spawn during March and April. They are sometimes cured by salting, but the usual method is to dry and smoke them; the familiar Finnans H. is so named after the fishing vil. of Findon, Kincardineshire.

Haddon Hall, one of the most famous old Eng. baronial mansions, stands on the R. Wye, 2 m. S.E. of Blakewell in Derbyshire, and 23 m. N.N.W. of Derby. The styles of the architecture range from the Norman to the sixteenth and seventeenth centuries. Before the Conquest it was the property of the Crown, but William I. granted it to Wm. Peveril. It has been successively in the families of Avenell, Vernon, and Rutland. It is referred to by Scott in *Peveril of the Peak*. See S. Rayner, *History and Antiquities of Haddon Hall*, 1836; G. Le Blanc Smith, *Haddon, the Manor, its Hall, its Lords, and Traditions*, 1906.

Hadersleben, or **Haderslev**, seaport and tn. of Denmark, in Slesvig, situated on the H. Fjord, an inlet communicating with the Little Belt. A considerable export trade is carried on in grain, seeds, hides, etc., and among the industries are iron founders and engineering works. Pop. 16,000.

Hades, in Gk. mythology, was the name applied to the kingdom of the underworld, the place of the departed spirits or shades. It is the Gk. trans. of the Heb. *sheol*, which is frequently referred to in the N.T. H. was also the personal name of the king of the underworld, Dis or Pluto (q.v.), who is sometimes represented as seated on a throne of sulphur from which issued the streams of Lethe, Cocytus, Phlegethon, and Acheron, which traversed the kingdom of the dead. For the legend of Dis's rape of Persephone, see PROSERPINE.

Hadfield, par. and vil. of Derbyshire, England, on the Cheshire border, 2 m. N.W. of Glossop. The cotton industry is carried on. In the Catholic church are some noted pictures, including a 'Transfiguration' by Raphael. Pop. 6000.

Hadhramaut, dist. on the S. coast of Arabia, bounded W. by Yemen, E. by Oman, and N. by the Dahna desert; modern Arab geographers restrict the name to the dist. between 48° and 51° E. It is part of the E. Aden protectorate, and consists of the Qaaiti state of Shibr and Mukalla and the Kathiri state of Selyun. It consists of a plateau, cut into deep

ravines, between a strip of coastland and the range of hills which bound the interior desert. The climate is dry but healthy, the inhab. mainly of S. Arabian stock, and the chief pursuits agriculture, cattle-breeding, date, indigo, and tobacco cultivation. The chief tns. are Shibam, Salyunn, Tariba, and Tarim. It is under Brit. protection and control. In the account of H. by Eratosthenes the people are called Chatromotite and in the earliest Gk. accounts are included in the Sabaeans (see *SABAEI*). The first European who penetrated into this land of fanaticism, as were the Hadhramitis, was Leo Hirsch, and the next was Theodore Bent and his wife, with a number of followers. Bent's discoveries put the geography of the H. in a new light, and it was no longer regarded as merely a S. dist. of Arabia between the coast and the central desert, but as a wide central artery extending for more than 100 m. parallel to the coast through which the valleys of the high Arabian plateau discharged their meagre supplies of water to the sea near Sahlut. Hymaritic inscriptions found in the valley establish that sev. centuries B.C. the name Hadramaut (or Hadramut or H.) is applied to this valley only, the meaning of which was Valley of Death, and that there from time immemorial was plied the historic trade in frankincense and myrrh which centred in Shibam. Once the country was held to be a dependency of the Yemen. In 1934-35 W. H. Ingram, a political officer of the Aden protectorate, with his wife, toured the country, collecting much extremely interesting information, which was subsequently embodied in a report issued through the Colonial Office. In 1938 Miss Freya Stark also made a journey among the Hadhramitis, and described her adventures in books and articles. Pop. (estimated) 150,000. See L. Van der Berg, *Le Hadramut et les colonies arabes*, 1885; J. T. Bent, *Southern Arabia*, 1895; Freya Stark, 'Two Months in the Hadhramaut,' *Geographical Journal*, Feb. 1936, *The Southern Gates of Arabia*, 1936; *Seen in the Hadhramaut*, 1938; 'An Exploration in the Hadhramaut and Journey to the Coast,' *Geographical Journal*, Jan. 1939; W. H. Ingram, *A Report on the Social, Economic, and Political Condition of the Hadhramaut* (H.M.S.O.), 1936. 'The Hadhramaut, Present and Future,' *Geographical Journal*, Oct. 1938; 'Hadhramaut: a Journey to the Se'ar Country and through the Wadi Masila,' *Geographical Journal*, Dec. 1936; 'Unexplored Regions of the Hadhramaut,' *Journal of the Royal Central Asian Society*, vol. xxiii., July 1936.

Hading, Jane, stage name of Jeanne Alfredine Tréfouret (1850-1944), b. at Marseilles, daughter of an actor. Sang in operetta in Marseilles. She made her appearance in Paris at the Palais Royal in *La Chaste Suzanne*, and in 1883 made a great hit at the Gymnase in *Le Maître des forges*. She married the manager of the theatre, Victor Koning, in the following year, but divorced him in 1887. In 1888 she toured America with Coquelin, and on her return played at the Vaudeville in London with great success.

Hadj or Hajj, the Arabic word, meaning literally a setting out, is used for the greater pilgrimage of Moslems to Mecca which takes place from the eighth to the tenth of the twelfth month of the Muslim year, and which every Moslem whose wealth and health will permit of it must perform once at least in his lifetime. The term is used more loosely to include the 'umrah or lesser pilgrimage to Mecca, a Moslem's pilgrimage to any shrine or sacred place, and also the pilgrimages of E. Christians to Jerusalem. The title of hadji is given to all Moslems who have performed the greater pilgrimage. See MECCA and MOHAMMEDANISM.

Hadleigh, tn. in the co. of Suffolk, England, situated 9½ m. W.S.W. of Ipswich. It is a very old-fashioned and old-world tn., and contains many quaint houses. It is chiefly noted for the possession of a very fine church. Pop. 3000.

Hadley, John (1682-1714), Eng. mathematician and mechanician. He greatly improved the reflecting telescope, and in 1731 he invented a reflecting quadrant or sextant. His claim to the invention was disputed, a glazier in Philadelphia named Thomas Godfrey (1704-49) having invented a similar instrument, but it was satisfactorily proved that each had worked independently.

Hadley, par. and vil. of Shropshire, England, situated in the Wellington div., 10 m. E. of Shrewsbury. Coal and iron are found, and the works of the Shropshire Iron Company are here. Pop. 3000.

Hadow, Sir (William) Henry (1859-1937), Eng. musician and scholar; b. at Ebrington, Gloucestershire; eldest son of Rev. Wm. Elliot II. Educated Malvern; Worcester College, Oxford. Formerly fellow, Worcester College; examiner in languages at different periods between 1900 and 1908. Occupied educational posts with troops during First World War. His *Report on the Education of the Adolescent* contains many important ideas. One of these is that 'all children who do not go forward to "secondary education" in the narrow sense of the word, should go forward none the less to a form of secondary education, in the inner and broader sense of the word, and after spending the first years of their school life in a primary school should spend the last three or four years in a well-equipped and well-staffed modern school, under the stimulus of practical work and realistic studies, and yet, at the same time, in the free and broad air of a general and humane education.' Hon. D.Mus., Oxford, Durham, Wales. He lectured for some time for Stainer (q.v.), prof. of music, Oxford. He was president of the Federation of Musical Competition Festivals and of the conferences on musical education, held in Lausanne, 1929 and 1931. His *Studies in Modern Music* (1894-95) and *Sonata Form* set a new standard in Eng. musical literature. He also ed. the *Oxford History of Music* (sev. vols., from 1901) and pub. *English Music* (1931). His compositions include chamber music and songs.

Hadrian, see HADRIANUS.

Hadrianopolis, see ADRIANOPLIS.

Hadrian's Villa, near Tivoli (Tibur), Italy, about 17 m. E.N.E. of Rome, a country residence of the Emperor Hadrian, a magnificent building with gardens, temples, a palace, theatres, and a stadium, all miniatures of the most celebrated places in the provs., and filled with art treasures.

Hadrian's Wall, name generally given to the remains of the Rom. fortification stretching from Wallsend on the Tyne to Bowness on the Solway, probably built by command of the Emperor Hadrian in A.D. 122 as a turf wall. It was repaired

and exquisitely arranged museum at Chesters (anc. Cilurnum); his great-grandnephew, John Maurice Clayton, presented the collection to the nation under a body of trustees. The museum contains over 300 inscribed or sculptured stones; a collection of jewellery, household and toilet implements, votive offerings, sculptures, inscribed altars, objects in bronze and pottery, a reproduction of the 'Chesters Diploma'—a bronze tablet of the year A.D. 145 officially giving a soldier his discharge and full rights of Rom. citizenship; the original was presented by John Clay-



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HADRIAN'S WALL

and partly rebuilt in stone by Septimius Severus in A.D. 197–208. The fortification consists of (1) a stone wall to the N. with a ditch on its N. side to act as an obstacle to Pictish cattle raids; (2) a series of forts, blockhouses, and towers along the rampart in which were quartered the 11,000 auxiliary troops who maintained continuous patrols along the frontier; (3) an earthwork to the S., fenced with stakes, and called the *rallum*, whose function was merely to mark the exact *limes* or boundary of Rom. ter. The total length of the wall, from one coast to the other, is 73½ m.; its greatest width is 9½ ft. on a foundation 10½ ft. wide, but in some places, in order to economise material, the builders had reduced the width to 7½ ft. Since 1922 a great many excavations have been made, bringing to light many new treasures and inscriptions of archaeological interest. In 1924 it was taken under the authority of the Office of Works, which now accords it a much-needed protection against vandalism and sees to the preservation of the ruins. John Clayton (1792–1890) made a magnificent collection of antiquities found in the Rom. wall, and in 1895 his nephew stored them in a small

ton to the Brit. Museum. Housesteads Camp, with 2 m. of the wall and a milecastle, was presented to the National Trust in 1930, and in 1942 the trust acquired Hotbank Farm, adjoining Housesteads, with a further 2½ m. of the wall. Hotbank Farm (900 ac.) is bounded on the S. by H. W. and the views at Crag Lough, or Peel or Hotbank Craggs, cover a wide area of wild and romantic beauty. In 1946 negotiations were completed for the transfer to the minister of works of part of the wall, a fort, a mile-castle, three turrets, and the remains of a bridge. It has long been the hope of antiquaries that the wall and all that the name covers—*rallum*, N. ditch, military road, forts, turrets, and milecastles—should belong to the nation, for only in that way can it be really available as a laboratory for archaeological research. Since the present (1919) piecemeal ownership prevents its opening up for the benefit of students and tourists. See J. C. Bruce, *the Roman Wall*, 1851; F. G. Collingwood, *Guide to the Roman Wall*, 1926, and *Archaeology of Roman Britain*, 1930; J. Mothersole, *Illustrated Hadrian's Wall*, 4th ed., 1929; and S. E. Winholt, *Britain under the Romans*, 1945.

Hadrianus, Publius Aelius (A.D. 76–138), generally called Hadrian, emperor of Rome, A.D. 117–38. In A.D. 85 or 86 he was placed under the guardianship of Ulpius Trajanus (afterwards the Emperor Trajan) at Rome. He held various public offices in Rome; distinguished himself in the Dacian campaigns; was *legatus praetorius* of Lower Pannonia in 108, *legatus* in the Parthian campaign (113–17). When the emperor fell ill in the E., he formally adopted Hadrian as his successor, and left him as commander in Syria. Hadrian was proclaimed emperor on Aug. 11, 117, and promptly proceeded to simplify the difficulties which besieged him at home and abroad by adopting a peaceful policy. He made peace with the Parthians, abandoning Mesopotamia and Assyria to them; appeased the Roxolani, who had invaded Moesia, and sent Marcus Turbo to pacify Mauritania. In 118 he hastened back to Rome to remove the unfavourable impression produced by the execution of some conspirators who had plotted his assassination. In 119 he began his celebrated travels through the empire, visiting Gaul, Germany, Britain, Spain, Mauritania, and Egypt. From 125 to 126 he was in Athens; in 130 on the Nile, where he lost his beloved Antinous; in 134 he returned to Rome and passed the remainder of his life between the cap. and his beautiful villa at Tibur. Hadrian was a capable and just ruler, and, except during his last illness, when he was subject to fits of violent cruelty and severity, succeeded in endearing himself to his subjects, and at the same time remaining a strict disciplinarian. He introduced various constitutional reforms at Rome, and was a patron of poets and scholars, while his magnificent buildings, especially in Athens and Rome, have been the admiration of succeeding centuries. See F. Gregorovius, *The Emperor Hadrian* (Eng. trans.), 1898.

Haeckel, Ernst Heinrich (1834–1919), Ger. biologist, b. at Potsdam. He studied medicine and science at Wurzburg, Berlin, and Vienna under Müller, Virchow, and Kolliker. He began to lecture at the univ. of Jena in 1861, and was prof. of zoology there from 1862 to 1909, with short intervals spent in travelling in search of zoological specimens. He was equally famous for his detailed zoological researches and for his generalisations on biological themes. In the former he confined himself mainly to the Invertebrata, and publ. *Die Radiolarient* (1862); *Die Kalkschwämme* (1872), on calcareous sponges; *Das System der Medusen* (1879–81), on jelly fishes, and numerous smaller works, as well as his contributions to the *Challenger* reports—on *Deep-sea Medusæ* (1882), on *Siphonophora Keratosa* (1888), and *Radiolaria* (1889), all beautifully illustrated with superb plates which show the author's supreme skill in draughtsmanship. In the work of generalisation in biology his greatest achievement was *Generelle Morphologie* (2 vols., 1868), a treatise on animal morphology in the two sections of tectology (structure) and promorphology, much of which he subsequently rewrote

in his *Natürliche Schöpfungsgeschichte* ('Natural History of Creation') (1867). H. was one of the first to attempt to draw up a genealogical tree (*Stammbaum*) exhibiting the relationship between the various orders of animals with regard both to one another and their common origin, and his theory that the life hist. of the individual is more or less a recapitulation of its historic evolution, embodied in his *Studies on the Gastraea Theory* (1873–84), has been generally accepted, though with some reservation in recent years. H.'s more popular works are very brilliantly written, but he is not always so careful in statement as Darwin, while his monist theories result in a materialistic tendency in his writings. His most notable treatise is *Natürliche Schöpfungsgeschichte* ('Natural History of Creation'), in which he divides the whole animal creation into two categories—the Protozoa, unicellular, and Metazoa, multicellular animals—the former remaining throughout their existence single-celled, while the latter were built up of cells innumerable. Of these studies the most striking outcome was the stem of the human race, in which he traced the descent of man through six-and-twenty stages from Monera, that is simple structureless masses of protoplasm, up to the chimpanzee, and *Pithecanthropus erectus*, remains discovered in Java, which he held to be the missing links between primitive man and the manlike apes. (See ANTHROPOLOGY.) When Darwin publ. his *Descent of Man* in 1871 he observed that H. in his *Natural History of Creation* had fully discussed man's genealogy, and said that had this work appeared before his own essay he should probably never have completed it. Almost all the conclusions at which he (Darwin) had arrived, he found confirmed by this naturalist, whose knowledge on many points was much fuller than his. On the controversial subject of the inheritance (see HEREDITY; WEISMANN) of acquired characters, H.'s conclusions agreed with those of Lamarck and Darwin, that the hereditary transmission of acquired characters was one of the most important phenomena in biology, that it was proved by thousands of morphological and physiological experiences, and was an indispensable foundation of the theory of evolution. In support of this view H. refers to the inheritance of rudimentary organs, which once were serviceable in our simian ancestors, but are now utterly useless or even injurious—as, for example, the appendix, the frequent disease of which is the cause of appendicitis. But this illustration misses the point at issue. The inheritance of useless rudimentary organs is admitted; it is the inheritance of acquired characters which is denied by many modern biologists—whether these qualities be useful or ornamental. Sir Francis Darwin adhered to his father's views, as did Herbert Spencer to the end; that view being that if parents acquired any useful characteristic their offspring would generally inherit it; but many Brit. biologists have been in agreement with Weismann, whose famous germplasm theory is

to the effect that only those characters can be transmitted that were contained in rudimentary form in the embryo. H.'s reputation as a monistic philosopher is much less secure than his reputation as a biologist. In importing his evolutionary theories into the realms of philosophy, morals, and religion, he advanced propositions in physics which no physicist would admit and which only betray his limited acquaintance with the subject. His *Die Weltträtsel* (trans. into Eng. as *The Riddle of the Universe*), which enjoyed wide popularity among Eng. readers, contains theses on the 'monistic view of substance' which have been summarily dismissed by the spiritualist Sir Oliver Lodge (*Life and Matter*) as mere nonsense; yet H.'s book is padded with quaint theses on the fundamental forms of substance in which H. believed that he had proved that there was no immortal soul, or free will, or personal God. Even in questions of natural hist., when he attempts to philosophise, he writes with like crudeness. Yet H. really thought his Monism a very essential part of his work. This theory of Monism was, however, by no means novel. Plotinus, Spinoza, Berkeley, Hegel, and Schopenhauer were all, each in his way, Monists. Where men have denied mind and have denied matter, H. conjectured substance as the foundation of both—which is only materialism 'dignified with a higher title.' (Consult on this Herbert Spencer's *Synthetic Philosophy*). But while H. the monist will be forgotten, H. the naturalist will live. His *Anthropogenie* (1874, trans. into Eng. as *The Evolution of Man*, 1879) and his *Lectures on Development and Evolution* (1878–79) were very widely read. Extending his theory of evolution from zoological subjects, H. applied it to problems of philosophy and religion, embodied in *Die Weltträtsel* (1899, Eng. trans., *The Riddle of the Universe*, 1901) and *Die Lebenswunder* (1904, Eng. trans., 1904). His other works include *Ursprung des Menschen* (1898, Eng. trans., *The Last Link*, 1899); *Aus Insulinde* (1901); *Wanderbilder* (1905); *Das Menschenproblem und die Herrentiere* (1907); *Das Weltbild von Darwin und Lamarck* (1909). See lives by W. Börsche, 1900; W. McCabe, 1906; H. Schmidt, 1928; V. Franz, 1934; and G. Wichtler, 1934.

Hæmatemesis, blood vomiting, from changes originating in the stomach wall, as in cases of ulcer, the result of long-continued dyspepsia. The haemorrhage may be sudden and unexpected in cases in which the dyspepsia has lasted so long that individuals regard it as their normal condition, to which they have become accustomed. H., however, may also occur suddenly and unexpectedly on account of liver trouble. It may also be the result of swallowing blood coming from the mouth and nose.

Treatment.—Until the bleeding has ceased, and its cause has been certainly decided upon, it is inadvisable to take anything, solid or liquid, but to remain absolutely at rest, sucking pieces of ice and spitting out the water. In this way the thirst is relieved, but care should be taken

to prevent anything whatever entering the stomach. A thorough investigation of the cause is indicated.

Hæmatin, see HEMATIN.

Hæmatite, or **Hematite**, diferric tri-oxide (Fe_2O_3), obtains its common name from its characteristic blood colour. It crystallises in the rhombohedral system, and is isomorphous with corundum. *Elba iron ore* or H. from Rio Marina often possesses a brilliant metallic lustre which may be iridescent; this particular form receives the name of *specular iron ore*, and has a hardness of 6, and sp. gr. of 5·2. H. may also exist in fibrous or granular conditions, and an impure earthy form, *red ochre*, is an economic product. The hard fibrous form from Spain is used by bookbinders, goldsmiths, and others as a burnisher. In the N. of England fibrous H. often occurs in concretionary masses, it then receives the name of *kidney ore*, in recognition of its appearance on fracture. H. is widely distributed, and has been known since very remote days, having been occasionally cut and polished as an ornamental stone by the Assyrians, etc. The modern use of the mineral is as an ore of iron, and being remarkably free from phosphorus it is particularly suitable for the manuf. of steel. Analyses of certain specimens have closely approached the theoretical 70 per cent of iron for this oxide. Important mines occur in Elba, Spain (Bilbao), and Scandinavia on the Continent. Large deposits also occur near Lake Superior. In Britain the chief supplies are in W. Cumberland and N. Lancashire. Apart from the uses mentioned above, ground H. is used largely in paint manuf.

Hæmatoxylin, colouring extracted from logwood (*Hæmatoxylon campeachianum*). Its chemical formula is $C_{10}H_8O_4$, and is in itself a crystalline substance and nearly colourless, but when combined with oxygen becomes a reddish colour, forming a substance known as hæmatin. H. is used for dyeing, principally to produce blue and black colourings. In biology it is employed as a stain for the nucleus and chromosomes.

Hæmatozoa (literally blood animals), worms of the genus *Filaria* that inhabit the blood. In humans these animals only breed in the tropics. They cause the legs to swell until they attain a considerable size and have the straight up-and-down appearance of an elephant's legs. Hence the condition is known as elephantiasis. Various other symptoms are produced, but these are less characteristic than the appearance under the microscope of the worms.

Hæmaturia, blood in the urine. This may come from the urethra or bladder, from injury, ulceration, or tumours. It may occur as simply trickling or preceding the voidance of urine, as clots, or oozing at the end of the act. It may be derived from the kidney, when it causes a smoky colour, or it may be in such minute quantities that it can only be detected by the microscope or by chemical tests. Blood from the kidneys is found as a complication in various diseases originating in the

kidneys, and also in fevers and general diseases. Other causes of H. are cancer of the bladder, stones in the bladder or kidneys, rupture of vessels in these parts or, at and after middle life, of the prostate. It occurs in tubercle, in which, however, it is usually a late symptom, and also appears in inflammation of the bladder. When, on account of clots, or from other cause, there is pain, the application of heat, by fomentations or hip baths, is indicated.

Haemoglobin, protein occurring in the red blood-corpuscles which possesses the property of combining with oxygen and again yielding up the same when the concentration of oxygen sinks below a certain amount (*see Blood*). H. gives a definite absorption spectrum which is quite different from that of oxyhaemoglobin (the oxygenated product). In colour it is purplish-red, whilst oxyhaemoglobin is bright red. This difference in colour may be noticed by comparing venous and arterial blood. H. also has the power of combining with carbon monoxide, giving a compound carboxy-haemoglobin, which has a much brighter red colour than oxyhaemoglobin. The poisonous character of carbon monoxide is due to this property of forming with H. a more stable compound than oxyhaemoglobin; H. is easily decomposed into a pigment haemin which contains iron, and a protein globin which seems to belong to the group of histones. Haemin has the formula $C_{44}H_{56}N_4O_4FeOH_2$, and is chemically related to chlorophyll, the green colouring matter of plants. H. occurs in some invertebrates, e.g. the earthworm, the 'blood worm,' and the 'water flea' (*Daphnia*). In molluscs and crustaceans it is replaced by haemocyanin, containing copper instead of iron.

Hæmophilia, literally, a tendency to bleed. This is also known as the haemorrhagic diathesis. Patients suffering from this are known as 'bleeders.' H. is a condition in which the blood flows very slowly, and consequently, from the slightest injury, haemorrhage persists for some considerable time, and even the smallest wound may be fatal. The condition is of great interest, as it is distinctly hereditary, being transmitted by women, but exhibiting its symptoms in men only. Tooth extraction and other operations are much dreaded by dentists and surgeons, as, except for the tendency to bleed, there is no other sign or indication of disease. The bleeding may be internal, under the skin, when the slightest injury causes extensive discoloured bruises. In joints slight injuries result in bleeding into them, so that they swell to considerable size and become useless. A fall on the head may result in bleeding in the brain, which may be fatal. A popular fallacy that a bleeder has a skin too small for him originated in the official statement that this was what a distinguished personage, with this disease, was suffering from. As regards treatment, various methods to promote clotting have been tried, varying from administration of calcium salts through the mouth to injections of egg albumen and other substances, but none are completely effective. See also HEREDITY, Types of Inheritance.

Haemoptysis, spitting of blood, that is, haemorrhage from the lungs or air passages; a common, if not the most frequent, symptom of tuberculosis. It has consequently come to be unduly feared, because looked upon as identical with consumption, whereas it may be beneficial as an indication of a condition which, when treated early, results in complete recovery and the restoration of good health. On the other hand, in the course of consumption, unexpected bleeding may occur and cause death by choking. The main lines of the treatment of H. are to keep the patient absolutely flat on the back, with perfect rest of mind and body. Warm drinks should be avoided and all food taken cold, or even nothing taken at all, except sucking small pieces of ice.

Haemorrhage, bleeding. This may occur from an artery, when the blood spurts out in jets synchronous with the pulse beat

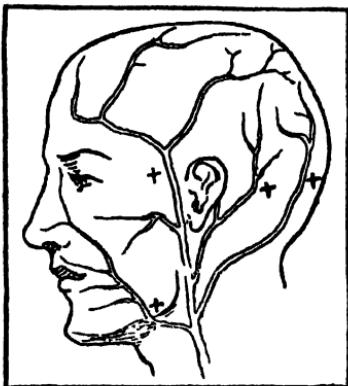


HAEMORRHAGE

- A Compression of the subclavian artery
- B Compression of right carotid artery.
- C Compression of the brachial artery from behind

and contraction of the heart; the blood is scarlet in colour. From a vein the blood is purple and flows in a continuous steady stream. Oozing, or capillary bleeding, is intermediate in tint between the two former ones. It is more readily controlled than the others, though in a place where the bleeding spot cannot be reached, as in the nose, it may continue for a considerable time. The main art of the surgeon is to perform an operation with as little bleeding as possible and to control the H. in cases of injury. Thus, to discuss bleeding fully would be to write a treatise on surgery. The main points, however, are to apply pressure on the bleeding spot; this is usually sufficient in a case of oozing, such as occurs in small cuts, when no large vessels are severed. In venous bleeding, the parts should be raised and pressure applied on the distal side of the wound.

(i.e. on the side away from the heart); H. from varicose veins, however, requires pressure on both sides of the wound. In cases of arterial bleeding pressure should be applied in the course of the artery between the wound and the heart, or a bandage tied round the part sufficiently tightly to check the H. Styptics are used to stop H.; they include very hot or very cold water, adrenal, pituitary extract, and fibrin foam. The cautery can also be employed.



HEMORRHAGE

+ points where arteries can be compressed in the head

Haemorrhoids, see PILES.

Hæmus, see BALKAN MOUNTAINS.

Haest, see under HASTINGS.

Hafnibredl, Joseph Alexander, see HAFNER.

Haffkine, *Waldemar Mordecai Wolff* (1860-1930), bacteriologist; b. at Odessa, of Jewish race; became a pupil of Pasteur; held for some time the post of prof. of physiology at the Genova medical school. From there he went to India, where he was made director-in-chief of the gov. laboratory at Bombay. He was the first to produce a vaccine for the treatment of cholera, his first inoculation being made at Agra in 1893. Four years later he introduced a fluid for inoculation against plague. He was later appointed bacteriologist to the Indian Gov.

Haffs (Dan. *har*, sea), term applied to lagoons in the Baltic Sea. These lagoons are separated from the sea by *nehrungs*—strips of sand. The chief ones are Pommerscher or Stettiner Haff, Frisches Haff (50 m. long and over 10 ft. deep), and Kursischen Haff (60 m. long).

Hafiz, nom-de-plume of Khwâjá Shams-ud-din Mohammad, the greatest Persian lyric poet, 'the most Persian of the Persians' (FitzGerald). The date of his birth is doubtful; his death is variously given as 1388, 1391, and 1394. Little is known of his life except that it was mainly spent in Shiraz under the successive patronage of

the governor Shah Ishák, Shah Shujá, and the vizier Kawám-ud-din, at whose college he lectured on the Koran; of this his knowledge was unrivalled, and he is credited with having written a great commentary. His verses, which reveal an extraordinarily brilliant technical accomplishment, are expressed in terms of typical oriental hedonism—wine, roses, and lovely maidens; he has been called the *Anacreon of Persia*. But his writings had a deeper mystic significance, and expressed symbolically the religious idealism of the Sufis (*q.v.*). H. was apparently a Sufi by training, and a realist by temperament. The famous *Dīdān*, a series of ghazals collected by one of his pupils, is his best-known work, but no satisfactory complete trans. has yet appeared. The most important European study of H. was written late in the seventeenth century by a Bosnian, Sudí, Eng. trans. are Sir W. Osouley (1797-98); S. Robinson (1875); and H. Love (1877); E. Cowell's trans. of the *Odes* (1854); and Ahiml Majid and Cranmer Byng's *Rubáiyat* (1910). See H. H. Schaefer, *Goethes Erlebnis des Ostens*, 1938.

Hafnium, metallic element of symbol Hf, atomic number 72, and atomic weight 178·6. It was discovered by the Dan. chemist Coster and Hevesy, and is closely related to the element zirconium; zirconium ore almost always contain small amounts of Hf compounds. The metal is obtained by passing the vapour of a specially prepared iodide over a heated tungsten filament; also by heating the hydrofluoride, H_2HfF_6 , with sodium.

Hagar (Gen. vi.), Egyptian slave of Sarai, the wife of Abraham. She was evidently the companion as well as the servant of Sarai, and at the latter's wish became the concubine of Abraham, to whom she bore a son, Ishmael. Motives of jealousy then led Sarai to drive her out into the wilderness, where she received the oracle as to the future fate of the Ishmaelites.

Hagberry, see BIRD CHERRY.

Hagedorn, Friedrich von (1708-51), Ger. poet b. at Hamburg, contributed satirical works to the *Hamburg Patriot*. He imitated classical, Fr., and Eng. forms, and his work became popular, both in poetry and philosophy. See life by K. Epting, 1919.

Hagelberg, *W.* in Brandenburg, Germany, situated 22 m. S.W. of Potsdam. Noted for the victory obtained by the allies, under Hirschfeld, over the Fr., Aug. 1813.

Hagen, Walter (b. 1891), Amer. golf champion, b. at Rochester, U.S.A. Began playing golf as a boy, early showing great aptitude for the game. Won U.S.A. open golf championship in 1914 and again in 1919. Won the Brit. open golf championship in 1922, 1924, and 1928, and the Belgian open championship in 1924, in which year he also won the professional championship, U.S.A. He won the Canadian open championship, 1931.

Hagen, *tn.* Westphalia, Germany, 15 m. N.E. of Elberfeld. Before the Second World War it was one of the most flourishing industrial centres of the Ruhr, and possessed some fine public buildings, including a technical school with a special

engineering branch. There are large iron and steel works, and woollen, cotton, leather, paper, etc., are manufactured; there are also breweries and distilleries. In the neighbourhood there is an alabaster quarry, and limestone may be worked. In the allied operations for the envelopment of the Ruhr (April 1945), after the main industrial tns. in the N. part had been cleared, the enemy pocket of the Ruhr was split in two at H. on April 14. The E. half collapsed on April 16, when 80,000 prisoners were taken, and, on April 18, the whole pocket of resistance was finally liquidated, the total of prisoners reaching 320,000. Pop. 148,300.

Hagerstown, city and the co. seat of Washington co., Maryland, U.S.A., about 86 m. by rail N.W. of Baltimore. It is situated in a valley overlooked by the N. and S. Mts., and contains the Kee Mar College (1852) for women. Produces flour and agric. implements. Pop. 32,400.

Hag-fish, or *Borer*, name applied to all members of the *Myxinidae*, marine fishes belonging to the Cyclostomata; they occur off all the coasts of W. Europe and off the E. Amer. coast as far as Cape Cod. Their bodies are eel-shaped, with no lateral fins, and a slight median fin at the extremity; the head is equipped with four pairs of sharp tentacles, with which the H. attack cod, haddock, etc., devouring all the flesh and leaving only the skeleton of their prey. Shoals of fish are often destroyed by the various species of *Myrine* which, when not seeking food, lives in mud-beds at the bottom of the sea; *M. glutinosa* and other species secrete a thick glutinous slime. *Edellosoma* contains two species which occur in the S. Pacific:

Haggai (either 'born on a feast-day' or 'feast of Yahweh'), prophet contemporary with Zechariah, whose prophecies are contained in the book of the O.T. which bears his name. Little is known about the prophet himself, but from chap. II. 3 of his work we may gather that he was already an old man when he began to prophesy, being one of those who had seen the temple 'in its former glory.' His book contains four short prophecies all delivered in the latter part of the second year of Darius the king (520 B.C.), the first three dealing with the restoration of the temple, the last being a special promise to Zerubbabel.

Haggard, Sir Henry Rider (1856-1925), Eng. novelist and writer on agriculture; b. at Bradenham Hall, Norfolk, England. At nineteen years of age he went to S. Africa as secretary to Sir Henry Bulwer, governor of Natal. In 1877 he was a member of the staff of Sir Theophilus Shepstone, special commissioner for the Transvaal; and in 1878 he became master of the high court of the Transvaal. He married Miss Markson, of Norfolk, in 1879. He took a deep interest in rural and agric. questions, being an exceedingly practical farmer and gardener on his own estate. In 1902 he pub. *Rural England*, a valuable study of rural conditions and of agriculture. In 1905 the Colonial Office commissioned him to inquire into the Salvation Army settlements in the U.S.A.—his report being pub. in 1905 as *The Poor*

and the Land, with a scheme for national land settlements. *Cleway and his White Neighbours* (1882) was his first book. In 1884 he pub. *Dawn*, the first of his novels. This was followed by others, most of which were very successful. The most popular are *King Solomon's Mines* (1886), one of the best-written and most thrilling of his romances; *She* (1887); *Jess* (1887); *Alan Quatermain* (1888); and *The World's Desire* (1901), written with Andrew Lang. He received the honour of knighthood in 1912—in recognition of his services to agriculture, on which he wrote sev. books, for his novels were purely sensational. In a London nursing home, May 14.

Haggis, anct. Scottish dish, called by Burns 'great chieftain o' the puddin' race.' The stomach bag of a sheep, having been well washed, turned inside out and salted, is filled about half full (room being left for expansion) with the heart, liver, and lungs of the animal, all minced, together with a large onion, half a pound of oatmeal, a pound of suet, salt, pepper, and half a tea-spoonful of mixed spice; the addition of the juice of a lemon and some good stock is often found to be an improvement. The bag is then securely sewn up and left to boil for about three hours. It was common in England until the eighteenth century.

Hagi, tn. on the W. coast of Honshu, Japan, 145 m. N.E. of Nagasaki, which took a prominent part in the national movement for the abolition of feudalism. Pop. 21,000.

Hagiographa, The ('sacred writings'), name sometimes given to the miscellaneous books of the O.T. which are not grouped either with the Law or with the Prophets. Among these are the various poetical books, such as the Psalms, Lamentations, and Canticles, and the other three books, Ruth, Ecclesiastes, and Esther, which, with the two last, form the Megilloth or Tolls.

Hagiology, name of the body of literature dealing with the lives of Christian saints and martyrs. The oldest collection is *The Assembly of the Ancient Martyrs* by Eusebius. In the Gk. Church these collections of lives of the saints are called menologies (Gk. μηνος, month), and they can be traced from the ninth century. Among those of the W. Church, perhaps the most famous is the *Legenda Aurea* (Golden Legend, q.v.) of Jacobus de Voragine. The founder of hagiologic criticism was a Flemish Jesuit, Hieribert Rosvoorde (d. 1629), who pub. among other works, the *Vita Patrum* (Antwerp), 1615. He also arranged a great systematic collection of the lives of the saints, resulting in the *Acta Sanctorum*, and the foundation of the Belgian Society of Bollandists, who occupied themselves in the critical pub. of the *Acta Sanctorum* (q.v.).

Hagonoy, tn. of the prov. of Bulacan, Luzon, Philippine Is., on Manila Bay. It produces rice, Indian corn, sugar, and coffee. The chief industries are alcohol distilling and the weaving of native fabrics. Pop. 25,000.

Hague, Cap de la, cape in France at the N.W. extremity of the Cotentin peninsula,

in the dept. Manche, between Cherbourg and the is. of Alderney, on the Eng. Channel. It must be distinguished from La Hogue, which is a roadstead lying on the E. side of the peninsula, where the Fr. fleet, which was sent to the support of James II., was defeated by the Eng. and Dutch fleets in 1692. The Channel Is. are visible from Cap de la H.

Hague Conference, peace conference initiated by the Tsar Nicholas II. in 1899, with the object of 'a possible reduction of the excessive armaments which weigh upon all nations,' to be effected by 'putting a limit to the progressive development of the present armaments.' But it was not found practicable either in 1899 or in 1907 (the second conference) to achieve anything in this direction. The conference of 1899 estab. a permanent judiciary system ready to be called into action whenever two or more states desire a matter in difference to be settled. The convention provided for the conduct of good offices and mediation, inquiry by commissions into disputed matters of fact, the constitution of a permanent court, with an international office at The Hague. The provision for commissions of inquiry did good service in 1904, during the Russo-Jap. war, when a Russian fleet opened fire upon the Hull fishing fleet off the Dogger Bank. The second conference, 1907, passed an amended convention for the settlement of international disputes. Other matters discussed were the laws and customs of war, e.g., guerrilla warfare, etc., and the application to naval warfare of the principles of the Geneva Conference. Rules, too, were made at the first conference against the throwing of missiles from balloons, the use of missiles intended to diffuse suffocating gases, and the use of expanding bullets.

Hague, The (in Dutch, 's Gravenhage or Den Haag), official cap. of the Netherlands, situated about 2 m. from the North Sea. It is the usual residence of the court, and the seat of the States-general, though Amsterdam is still the commercial cap. of the Netherlands. Many of its streets are intersected by canals, bordered with rows of trees, and in the centre of the city is the artificial lake known as Vliver. The fashionable quarter of the city lies in the N., and here the prin. buildings are to be found; the royal palace, purchased by the states in 1595; a large monument by Jacquet commemorating the jubilee of the restoration of Dutch independence in 1813; the museum, Meermanno-Westreenianum, which contains specimens of early typography, and the royal library, which contains over 500,000 books, as well as coins and medals, antique gems, and some interesting MSS. Besides these, there are the gov. buildings situated in the Binnenhof, which was once surrounded by a moat, and was founded in 1249 by William II., count of Holland, whose son made it his residence; the prison, where the brothers De Witt were killed by the mob in 1672; the law courts, the building containing the state archives, and the Mauritshuis, which was built in 1633-44, and contains the famous picture gallery of The

H. The city, too, contains numerous churches, the Grote Kerk of St. James, which dates back to the fifteenth century and is Gothic in style; the Nieuwe Kerk, containing the tombs of the brothers De Witt and of the philosopher Spinoza, and many others. There are also a picturesque tn. hall, built in 1565, a fine modern railway station erected in 1892, and the famous royal villa 'Huys ten Bosch,' built in 1645, where the International Peace Conference was held in 1899. The H. was the bp. of the astronomer Huygens, the physician Boerhaave, and the place where Spinoza, to whom a monument has been erected, d. 1677. Here too, the Triple Alliance between England, Sweden, and the Netherlands, 1688, was signed; The H. Convention was assembled, 1899 and 1907, and the Palace of Peace designed by Cordouaner was completed in 1913. In 1912 the International Opium Convention was signed at The H. After the First World War, in 1920, a committee of the council of the League of Nations met here to promote a permanent court of international justice. This was concluded later in the year at Geneva and has (1930) its seat at The H. The H. Academy of International Law was opened in the Palacio of Peace in July 1923. The International Law Library was given by Carnegie and cost over £1,500,000. The chief industries are printing, cannon founding, copper and lead smelting, iron casting, gold and silver decorations, and the manuf. of furniture and carriages. In the Second World War the Ger. bombed the city during the invasion of May 1940. Sev. embassies, a maternity hospital, and a prison were hit. The city sustained further damage by bombing during the course of the war. Pop. 523,700.

Haguenau, tn. of France in the dept. of Bas-Rhin. It is about 16 m. N. of Strasburg, in the middle of the Haguenau Forest. It possesses two fine old churches dating from the twelfth and thirteenth centuries, besides other public buildings. The main industries are wool and cotton spinning and carpet weaving; machinery, boots, soap, wine, and oil are manufactured; and there are also breweries and potteries. It is a garrison tn. and dates from the twelfth century, when the dukes of Swabia had a hunting-lodge there. In 1154 the Emperor Frederick I. gave it tn. rights and built walls round it, and an imperial palace. In 1257 Richard of Cornwall, King of the Romans, made it an imperial city. Later it fell into the hands of the Fr., passing into the possession of Germany, 1871. By the treaty of Versailles, 1919, it passed back once more into the possession of France. Following the occupation of Strasburg by the Fr. 2nd Armoured Div. on Dec. 23, 1944, the 79th Amer. Div., which had been mopping up in the rear of the Fr. 2nd Armoured Div., resumed a northward advance and, with the 44th Amer. Infantry Div., made rapid progress towards H., which they took on Dec. 13. In the major offensive S. of the Moselle, begun by Gen. Eisenhower (March 16, 1945) to destroy the Ger. armies W. of the Rhine, two corps of the Seventh

(Amer.) Army attacked N. between H. and Saarbrücken. This S. thrust took the Ger. First Army by surprise, and resistance in the W. portion of the front became disorganised. Pop. 19,500.

Hahn, Helen Petrovna, see BLAVATSKY.

Hahn, Otto (b. 1879), Ger. chemist; began studies in radioactivity under Sir Wm. Ramsay, and then for a time worked with Rutherford in Montreal. In London he discovered radiothorium, an intermediate between thorium and thorium X, and in Montreal radioactinium. Returning to Berlin in 1906 he isolated mesothorium 1 in 1906, and mesothorium 2 in 1908, and from that time he continued to contribute regularly to, or to lead, advances in specialised chemical technique for pioneering work with the heavy radioactive elements. Collaborated for thirty years with Lise Meitner (1908-38), the physicist, a collaboration terminated only by the rigour of the racial laws of discrimination in Nazi Germany. During the war II. worked on the chemical side of the problem of uranium fission. While he missed the significance of nuclear isomerism he discovered the first recorded instance of this phenomenon (1921). In 1944 he was awarded the Nobel prize for chem. in recognition of his discovery (with F. Strassmann) of the neutron-induced fission of uranium and thorium.

Hahnemann, Samuel Christian Friedrich (1755-1843), Ger. physician and founder of homeopathy, b. at Meissen, in Saxony. He studied medicine at Leipzig and Vienna, and took his degree in 1779 at Erlangen. He practised first at Dresden, then, in 1789, settled at Leipzig. He was not satisfied with the state of the science of medicine, and in 1796 advanced a new principle, 'the law of similars,' i.e. that diseases should be treated by those drugs which produce symptoms similar to them in the healthy. Four years later he pub. his doctrine on a system of smaller doses of drugs. In 1810 his chief work was printed, *Organon der rationellen Heilkunde*, explaining this system, which he named homoeopathy. The hostility of the apothecaries forced him to leave Leipzig and find protection with the grand duke of Anhalt-Köthen. Fourteen years afterwards he went to Paris and practised homoeopathy with great success. See also MEDICINE, Homeopathy. See T. L. Bradford, *Hahnemann's Life and Letters* (Philadelphia), 1895, and J. H. Clarke, *Hahnemann and Paracelsus*, 1923.

Hai Cheng, tn. in the prov. of Lioutung, Manchuria, 20 m. N.E. of Newchwang. It was the scene of a Jap. victory over the Chinese in 1894, and over the Russians in 1904.

Haidarabad, see HYDERABAD.

Haidar Ali, see HYDER ALI.

Haiduong, or Haizuong, cap. of a prov. of the same name in Tongking, Fr. Indo-China, 32 m. E.S.E. of Hanoi, and largely in ruins. Pop. (prov.) 1,100,000, (tn.) 10,000.

Haifa, or Khalifa, seaport of Palestine, on the S. of the bay of Acre, 9 m. S.W. of Acre, and at the foot of Mt. Carmel. Corresponds to the classical Sycamum, but there is nothing of archaeological

interest in the present tn. Since 1890 it has rapidly developed, and is now the terminal point of three railways—one linking it with Damascus (an old line), a second built soon after the First World War and linking it with Egypt and the Suez Canal, and a third, built during the Second World War, linking it with Beirut and Turkey. It developed considerably in importance under the Brit. mandatory gov. The construction of a new harbour, at a cost of £1,250,000, was completed in 1933. There is a pier 425 yds. long. The pipe line from the Mosul oil wells terminates here (as well as at Aleppo). Egyptian cotton is cultivated. There are a secondary school, a dist. court under a Brit. president and two Palestinian judges, and a bench of honorary magistrates. A pleasing feature of the tn. is the 'Persian Garden' on the lower slopes of Mt. Carmel. Soap boiling is an industry of export importance. There are also cement and tobacco factories. Grain and oil are exported. In the Jewish terrorist outrages of 1940-47 damage to the amount of £250,000 was done by fire from explosions to the Shell oil installation at H. Bay on the night of March 30, 1947. The gov. imposed on the Jewish community collective measures for reimbursement of the cost. The pop. consists of Muslims, Christians, and Jews, and numbers about 145,400.

Haig, Douglas, first Earl (1861-1928), Viscount Dawick, and twentieth Laird of Beaufortyde; Brit. field-marshal; b. in Edinburgh, and educated at Clifton School and Brasenose College, Oxford, of which he was made an honorary fellow in 1915. From Oxford he entered the Royal Military College, and joined the 7th Hussars in 1885. He took his profession as a soldier seriously from the outset, and within a few years was a student at the Staff College, where, after gaining his 'p.s.c.' (passed Staff College), he joined the Egyptian Army. Served in the Sudan in 1898, being at Atbara and Khartoum. During the S. African war, 1899-1902, he held important posts, was promoted lieutenant-colonel, and awarded the C.B. He commanded the 17th Lancers for a short time, but his next important post was inspector-general of cavalry in India (1903-6). He was director of military training at army headquarters in 1906-7, and director of staff duties in 1907-9. Later he returned to India as chief of staff (1909-11), and in 1912 became general officer commanding-in-chief, Aldershot Command. When the Brit. expeditionary force went to France on the outbreak of the First World War he was in command of the 1st Army Corps, and in Dec. 1915 succeeded Sir John French as commander-in-chief. Haig's motto was 'Service—not Self,' and in accordance with this he gave himself up entirely to the service of ex-service men immediately after the conclusion of hostilities. Many organisations working on behalf of ex-service men came into existence as soon as demobilisation commenced, but H. saw that one strong body was what was needed, and by his personal efforts very were welded together to form

the Brit. Legion (*q.v.*), which remains a world-wide monument to his interests in the welfare of those who fought under him.

When H. was director of staff duties at the War Office before the First World War, he brought out the first ed. of the *Field Service Regulations*. This, as well as his *Cavalry Studies*, shows the thorough grasp he had of his profession. For his eminent services during the First World War he received the thanks of Parliament,



LORD HAIG

a grant of £100,000, and was raised to the peerage, taking the title of Earl Haig of Beaumont in the co. of Berwick. H. was probably the most popular figure in Great Britain that emerged from the First World War. Comparisons with generals of former times are unprofitable, yet military writers have essayed the task of estimating H.'s capabilities as a general. No doubt his name lacks the *éclat* or almost legendary glamour of that of the duke of Wellington. As a strategist and tactician, too, H. was by no means the equal of the Iron Duke; but standards of comparison are difficult to make because, whereas Wellington commanded in wars of movement, it fell to H.'s lot to command for years in trench warfare and, at the most vital periods, under the supreme command of Foch. His qualities as a soldier were attacked in Lloyd George's memoirs (1931), largely on account of the grim fiasco of the battle of Passchendaele. In 1905 he married the Hon. Dorothy Vivian, daughter of the third Lord Vivian. He d. suddenly on Jan. 29, 1928. See also FRANCE AND FLANDERS, FIRST WORLD WAR CAMPAIGN IN. For dispatches, consult Sir Douglas Haig's *Despatches*, ed. by Lt.-Col. J. H. Boraston, 1919; and for an account of his leadership, see G. A. B. Dewar and J. H. Boraston, *Douglas Haig's Command*, 1922; and G. Duff Cooper, *Haig*, 1933.

Haik, *see* ARMENIA.

Hai-k'ou, *see* HOI-HAU.

Hall, Central Arabia, *see under* JEBEL SHAMMAR.

Hall and Hailstorms. In old text-books hall used to be described as frozen rain, but its production is now ascribed to more complex atmospherical conditions than were then supposed. Volta suggested that when two clouds, charged respectively with positive and negative electricity, lie one above the other, hall is produced by electric discharges passing up and down through the moisture-laden atmosphere. More modern theories depend on the fact that condensation in the atmosphere takes place, even at temps. below freezing, mainly into 'supercooled' water droplets. If the motion in the cloud is very turbulent (this is the case in thunderstorms) an ice particle, when formed, may be carried up and down many times in different currents; it will then collect, either by coagulation with supercooled water drops or by condensation, sev. coats of ice. Near the bottom of a downward and upward journey the ice particle may pass through regions with temp. above freezing when a layer of water forms on the particle. When again reaching freezing regions this freezes and forms clear ice; an opaque skin is formed by collision with supercooled drops and at the same time trapping a little air. Hail-stones are therefore commonly spherical, but other shapes that have been observed on rare occasions are rough prisms, four-sided pyramids, lens-shaped disks, and rather jagged-shaped masses with projections in sev. directions. E. G. Bilham and E. F. Relf calculated the velocity of fall of spherical hail ranging up to 60 m.p.h. for a stone 1.5 in. in diameter and to nearly 120 m.p.h. for a stone 5 in. in diameter and weight about 1.5 lb., which they also considered to be the theoretical maximum size. A. Wegener gives the largest known hailstone to have weighed 1 kg. (2½ lb.), but this is not considered so authentic as a stone which fell at Potter, Cheyenne co., W. Nebraska, on July 6, 1928, which had a diameter of 5.4 in. and weighed 1½ lb. Damage during hailstorms has sometimes been very severe; Sir George Simpson quotes a storm at Kathiawar in India where, over a very large area, all the cattle (buffaloes) were wiped out by hailstorms; one of the worst storms in England occurred on June 21, 1897, in Essex, when hailstones fell in various shapes, commonly as large as hens' eggs. In July 1788 a hailstorm passed over France in two parallel belts, each only about 9 m. wide, one 500 m. and the other 600 m. in length. In the interval between them, 13 m. wide, rain fell in torrents.

Hail, Mary, *see* AVE MARIA.

Hailé Selassie (or Silassie) I. (b. 1891), emperor of Abyssinia, known prior to his coronation in 1930, as Ras Tafari Makonnen; son of Ras Makonnen, and great-nephew of Menelik; officially styled 'King of Kings, Conquering Lion of Judah, Elect of God, Emperor of Abyssinia.' A romantic if small figure of a man, possessing

the traditional beauty of David's line, no darker than many Spaniards, clear-cut features, mobile face, short silky beard. The deposition, through his exertions, of Lij Yasu, in 1916, removed a menace to European interests in Africa, for that emperor, besides being dissipated, was in touch with the Mad Mullah in Brit. Somaliland, and it is said that he aimed at extending his ter. to the coast so as to embrace Eritrea and the whole of Somaliland with the object of securing a kind of European suzerainty; a design which



HAILE SELASSIE I.

E. A. A.

could only have created international jealousies and difficulties—probably intended. But Lij Yusu was defeated in a barbarous campaign and, after dethrone- ment, placed in captivity near Fiche. In the spring of 1930 H. S. fought yet another campaign against Ras Gueesa, the divorced husband of the late Empress Zauditu, and brother-in-law of Emperor Menelik II., H. S. (then Ras Tafari) assuming the role of rightful heir fighting a rebel. The coronation of H. S. at Addis Ababa in Nov. 1930 was an event in the evolution of Ethiopian civilisation of first-rate importance, because it was the culminating point of the domination of the Christian Church party in conjunction with the leading families of Amhara over the Muslims and pagans of S. Ethiopia. The duke of Gloucester paid a visit to the cap. during the coronation of H. S., when Ras Kasse acted as his host. It is said that the latter had a better title to the succession than had H. S., and might with more resolution have reached the throne.

Succession, however, is regulated by royal proclamation and for the most part is rarely disputed in Ethiopia. H. S. is essentially a social reformer, and, though nearly all Abyssinians treat their slaves well, it was said to be the emperor's purpose gradually to abolish slavery. In this policy he showed courage, for Abyssinia was a turbulent state, the forces of reaction were strong, and all men were armed to the teeth. Energetic to a degree, H. S. also directed sev. commercial concerns in order to increase the national revenue. With his private printing press he printed part of the Scriptures and other religious literature in the vulgar tongue, so that the common people might read for themselves. In 1935 Italy overran Abyssinia and annexed the country, and H. S. fled to Palestine, afterwards residing in Great Britain. Early in 1941 he re-entered Abyssinia to lead his rebel troops against the Ita. and to recover his throne. In this aim he received much help in men and munitions from the Brit. Gov. and the Brit. authorities in the Sudan. H. S. has founded sev. educational, medical, and other institutions in Addis Ababa and other tns. of Abyssinia, and he is consistently engaged in trying to advance the Abyssinians to the standards of W. civilisation. See also ABYSSINIA. See Christine Sandford, *Ethiopia under Haile Selassie*, 1946.

Hailes, Lord, see DALRYMPLE, SIR DAVID.

Haileybury College, in Hertfordshire, England. One of the big public schools. It was founded by the E. India Company in 1806, as a training college for civil service cadets. Originally it occupied Hertford Castle, but in 1809 the college was removed to its present site, 2 m. S.E. of Hertford. In 1862 the present school was estab. and incorporated by royal charter in 1864. See Higginson, *Old and New Haileybury*, 1887.

Hailsham, Sir Douglas McGarel Hogg, first Baron (b. 1872), Eng. lawyer and politician, son of Quintin Hogg, founder of the London Polytechnic, Regt. St. Street, of which he has been vice-president and vice-chairman since 1902. Educated at Eton. First destined to a mercantile career, he studied sugar-growing in the W. Indios, but turned to the Bar and politics, gaining a large practice at the common law. Elected as Conservative member for Marylebone in 1922, and appointed attorney-general in the Conservative Gov. 1922-24, 1924-25. On the resignation of Lord Cave (q.v.) became lord chancellor 1928-29, and again from 1935 to 1938. Succeeded Lord Halifax as Lord President of the Council, 1938; resigned Nov. 1938. Editor of a new ed. of Halsbury's *Laws of England*.

Hallsham, mkt. tn. in the Eastbourne parl. div. of Sussex, England. It possesses a fine example of Perpendicular architecture in the church of St. Mary, and close by is the Augustinian priory of Michelham, with an old gatehouse and crypt. Topees and matting are manufactured, and there is a good agric. trade. Pop. 5000.

Hainan, is. off Kwangtung prov., China, separated from the mainland by H. Strait, and lying between the China Sea and the gulf of Tongking. Area about 16,000 sq. m. The central and S. portions are traversed by granitic mts. reaching an altitude of nearly 7000 ft., while the N. portion is an undulating plain, broken by isolated hills. The is. is well watered and produces timber, rice, sugar, cotton, etc. Chief tn., Klungchow (harbour, Hoishow), on the N. coast, which is a treaty port. It was seized by the Jap. forces in Feb. 1939 ostensibly to prevent the influx, from Indo-China, of arms and munitions for the Chinese nationalist forces. Pop. estimated at about 3,000,000.

Hainau, or Haynau, tn. in the prov. of Silesia, Prussia, about 10 m. W.N.W. of Liegnitz. Before the Second World War it was chiefly engaged in tanning and the manuf. of gloves and agric. implements. There were also iron foundries in the tn. Pop. about 11,400.

Hainaut (Flemish Henegouwen), prov. of Belgium, bounded on its S. side by France. Its fertile soil, its quarries, but most of all its extensive coal-fields, made it a highly industrialised centre. Iron and steel are produced in large quantities. The manuf. of glass and textile goods is also carried on. The cap. is Mons. The old co. of H. was united sev. times with Flanders. In 1433 it came under the rule of Burgundy; in 1477 under Austria; in 1555 under Spain. In the seventeenth century parts of it were acquired by France. It came again under Austria in 1714; was incorporated in the United Netherlands in 1815, and eventually became a Belgian prov. in 1830. Area 1437 sq. m. Pop. 1,270,000.

Hainburg, tn. in Lower Austria, on the R. Danube, 27 m. E.S.E. of Vienna. It is a fine old tn., surrounded by walls with a gate guarded by two ant. towers. There are numerous Rom. remains, and water is brought to the tn. by a long aqueduct. In 1477 it was besieged by the Hungarians, and five years later was captured by Matthias Corvinus, king of Hungary, and in 1683 it was sacked by the Turks. There is an historic old castle known in Ger. tradition as Haimburg, which the Emperor Henry III. took from the Hungarians in 1042. Before the Second World War it had one of the largest tobacco factories in Austria, and also a needle factory. Pop. 7500.

Hainichen, tn. of Saxony on the Little Striegis, 28 m. W.S.W. of Dresden, and 40 m. S.E. of Leipzig. There are collieries in the neighbourhood and it is noted for manufs. of cotton and linen goods; it is also a centre of the flannel manuf. Pop. 8000.

Haliphong, or Haifong, tn. and port of Tongking, Fr. Indo-China, situated on the Cua-Cam, one of the branches of the Song-Koi delta, about 20 m. from the gulf of Tongking. It is the second port of Fr. Indo-China, and a naval station, having communication by canal, riv., and railway. There is a sandy bar which prevents ships drawing more than 13 ft. from entering the harbour. Shipbuilding, cement works,

and cotton spinning are the chief industries. A centre of disturbance during the dispute between the Fr. authorities and the Viet-Nam republic after the Jap. occupying forces were driven out of Fr. Indo-China. The Viet Minh (League for the Independence of Annam) complained that the Fr. claim to maintain a customs house at H. was a contravention of rights conferred on Viet-Nam by a treaty concluded in March 1946. Fr. forces moved up in Dec. from H. to Hanoi, and occupied gov. buildings in the latter place. Pop. 70,000. See further under INDO-CHINA, FRENCH.

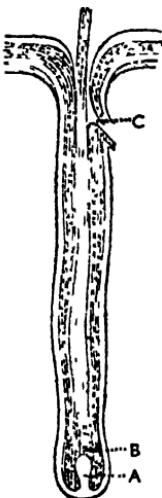
Hair, filamentous outgrowth from the skin, forming the coat of mammals, and corresponding to the feathers in birds. The word applies also to analogous outgrowths from insects and plants and other organisms. This article, however, is mainly concerned with human H. The human body, with the exception of the palms of the hands and the soles of the feet, is covered with short, fine Hs. or down, but on the scalp and, in the case of men, on the cheeks, etc., H. tends to grow both thick and long.

Physiology of Human Hair.—A H., like a nail, is built up from the corneous cells of the epidermis. It is shut up in a bag, called a H. sac, or follicle, at the bottom of which is a papilla. The superficial epidermic cells surrounding the papilla become horny and coalesce into a shaft, which is finally thrust out above the surface skin by new growths from below. When it has reached its natural height it dies, but not before a fresh papilla and sac have been formed so as to send up another H. to replace the old one. Each H. shaft has an elaborate structure. In the centre is medullary matter, which may contain air. This is wrapped round with a cortical substance, composed of elongated horn cells. Enveloping the latter is an outer cuticle made of flat cornaceous plates fitting transversely round the shaft. The cuticle in its turn is enclosed in the epidermis of the H. sac which corresponds to the integument, just as the dermis of the H. sac, which is the last coating, corresponds to the dermis of the integument. In these superficial layers of the follicle are the root-sheaths, which, as their name suggests, contain the root of the H. A fatty liquid, which lubricates the H., is secreted from the sebaceous glands, whose ducts open into the H. follicle. The phenomenon called goose-skin, when H. stands erect, usually through alarm or horror, is produced by the involuntary contraction of tiny H. muscles.

Growth of Hair.—A crop of head H. lasts from two to four years, but normally its loss is imperceptible, as a new one has meanwhile arisen to take its place. Baldness results when the powers of renewal are unequal to the loss. It is a natural process for H. to turn grey with age, but there are many curious cases on record where, under the influence of violent emotion, like inconsolable grief or panic, H. has turned grey in a night or even in a few hours. This misfortune is supposed to have happened to Marie Antoinette. In

some families white patches, or premature blanching of the H., are hereditary. Length of H. varies very considerably. There are records of crops 6 ft. long, but 24 ft. is an average length for a good growth of women's H.

Hair and Anthropology.—H. is an important anthropological criterion. There are four kinds, whether superficial or structural distinctions be taken into account. Most negroes have jet-black H., which is short and curly, and popularly



A HAIR IN ITS FOLLICLE.

A papilla, B, newest part of the hair growing on the papilla; C, mouth of a sebaceous gland

described as woolly. The yellow races have straight, coarse, lank, and, generally speaking, the longest H. The H. of Europeans is either wavy, or glossy and smooth, the colour varying from black to very fair browns or yellows, whilst 'flazy' H. is characteristic of the Australian aborigines, etc.

Hair Diseases are intimately related to many skin diseases, such as eczema, and in general the condition of the H. may be said to be symptomatic of the general health. Children especially are liable to vermin in their H., and an inflamed, itching scalp and a verminous head often lead to eczema, in which case a sulphur or an ammoniated mercury ointment should be smeared over the diseased parts. If a child suffers from ringworm, which is a highly contagious and troublesome skin disease, his H. will break off or fall out and bald circular patches be left. This disorder is due to a fungus which grows between the true skin and the scarf, and the safest remedy is to shave off the hair and then to apply some chemical agent, such as oil of cade or pitch mixed with glycerine to kill the parasite. Constitutional weak-

ness and many forms of debility may cause the forking, or splitting, or excessive shedding of the hair. Such evils may be checked by regular cutting, which undoubtedly strengthens the hair, but the best way to deal with them is to try to remove the much more serious bodily weakness which lies at their root. There are endless prescriptions for saving the H. and preserving it in good condition, but many of them emanate from quacks, and on the whole it is unwise to adopt any, unless recommended to do so by a properly qualified practitioner. Some aver that a drachm of balsam of Peru, well mixed with an ounce of simple cerate (melted), makes an excellent local application. Baldness is probably the most common of all H. diseases, and one which still continues obstinately to resist most treatments. Adults of the male sex are in particular prone to baldness, and are often faced quite early in life with the problem how to deal with it. General diseases such as fever, or a chronic constitutional malady like tuberculosis, may give rise to it, whilst other causes are excessive perspiration, which invariably weakens the epidermis, and a decrease in the supply of blood to the scalp, which often accompanies old age. Applications containing Sp. blistering flies or cantharides are often effective in stimulating the skin and thus encouraging the growth of another crop; perspiration on the head may be diminished by ventilation when under cover, and also by covering the head as little as possible; shaving two or three times in succession may promote another growth when the H. has fallen out after some serious illness, but should the misfortune be due to an eruptive disease, the patient should apply to his doctor, who will probably try some soothing and medicinal treatment. There is no cure for grey Hs. or the baldness of old age. This section may be closed with the mention of a disease which seems endemic only in Poland. A peculiar glutinous sweat exudes and renders the H. disagreeably matted and almost succulent. One symptom is great irritation of the scalp.

Trade in Hair is very considerable in Great Britain, but it is difficult to get statistics up to date as hair is usually included with hide, etc., in all tables of imports and exports. Peasant girls of France, Belgium, and Italy sell their H. to agents especially appointed for collecting it. Auburn and golden hues fetch a much higher price than browns, because of their comparative rarity. Great Britain obtains fair H. from Scandinavia and Germany, whilst coarser kinds are imported from India and China. Wigs, artificial fronts, etc., are produced both from long tresses and combings of human H. Long tail H. of horses is imported into this country from Russia and S. America to be woven into H.-cloth. Short horse-H. is curled and freely used for stuffing chairs and sofas. The H. of cows is utilised in the manuf. of roofing and boiler felts, and also of coarse rugs and blankets; plasterers employ it to bind the mortar applied to walls of houses; and the tail H. of oxen is

suitable for stuffing cushions and making barristers' wigs. Russian pigs' bristles are in great demand for toilet and decorators' brushes, whilst artists' brushes are made from camels' H. Even the tail H. of elephants has been turned to account, and is worked up into bracelets in Nyasaland.

Hairdressing has continued, since the beginning of things down to the twentieth century, to exercise and to tax to the utmost human ingenuities. Babes and young children are usually allowed to wear their H. as it grows, and Negroes for the most part leave their luxuriant and tousled masses as nature made them. But, speaking generally, a comparison of different tribes and nations brings out an extraordinary diversity in hairdressing, a diversity, moreover, which is hardly less remarkable when note is taken of the multiplicity of fashions which at one time or another have held an individual people in their grip. Perhaps savages have been most fertile in the invention of H. tortoises. Such tribes of Amer. Indians as the Dakotas and Iroquois wear a picturesque head-dress of gaily coloured feathers. All kinds of plumes and feathers are variously worn by different tribes all over the world, whilst Papuans wear bones; Maoris, sharks' teeth; Polynesians, flowers and coco-nut leaves; Danakils, porcupine quills; and Niam-niams, cowries for ornament. Some men in the New Hebrides proudly twist their H. into as many as 600 whip-cords, a process which takes years to complete, and certain natives of S. tropical Africa are at great pains to stiffen some strands into a screw-like tuft by means of fat, and then to decorate the same with an ostrich feather. Shaving, frizzing, greasing, and plaiting are devices everywhere practised for forcing the H. into fashionable shapes. A Chinaman shaves his scalp in front and wears his fine black pigtail behind. Jap. ladies coil their glossy H. into an elaborate chignon, secured by a great pin and made smooth with the aid of bandoline. Moslems have been known to clip away all their H. save a small clump, which in time will serve as a handle to raise them up to heaven. In England early Britons were remarkable for their long, bushy H., whilst Danes and Saxons also wore it long. In Edward I.'s reign men wore their H. in large curls, which stood out at the sides, whilst ladies confined theirs in a caul of gold network, or, as later, in a ponderous turban. In the days of Henry V. men cropped their H. hideously close, whilst in Tudor times they parted it in the centre, combed it down on either side, and turned it under all round. Cavaliers, during the Stuart period, wore their H. in curls over the shoulders until the Restoration, when the huge powdered perukes were borrowed from France, together with other eccentric modes. In modern times short cutting for men has become universal. The aim of extravagant and vicious taste in ladies' coiffures was reached in the eighteenth century, when, indeed, the trade of barber was elevated to a high art. The H. was gathered over a mighty erection of tow,

which was profusely adorned with pearls, glass beads, and all manner of jewels, mostly false, and with endless varieties of curls, plumes, ribbons, and bobs. If a court lady were economical, she would make one dressing suffice for three weeks, and often she would be obliged to go to the barber some days before a ball if she wished to ensure a new and extensive H.-dress. At all times false H., powders, pomatum, H. washes, and frames of every size and description have been in vogue. To-day the modes of hairdressing for women are still legion, but they are one and all free from the incredible monstrosities of the Georgian era. At the end of the First World War, because of its greater convenience, women began to 'bob' their H., cutting it to fall evenly all round the head. From this severe style the 'shingle' developed, when the H. was allowed to wave gently at the sides, but was cropped at the back to show the contour of the head. The 'Eton crop,' a very severe and masculine type affected mainly by the outdoor or sporting woman, is a practical schoolboy cut. From the frequency with which bobbed and shingled heads must be trimmed and waved, hairdressing has recently been looked upon as one of the most lucrative of trades. In Great Britain hairdressing is an organised calling. It has its trade organisations and papers, including the *Hairdressers' Weekly Journal* and *Hairdresser and Beauty Trade*. There is a Hairdressers' Registration Council, and a Hairdressers' Exchange and Employment Agency. Since 1930 hairdressers have been compelled by law to close their shops on Sundays.

Hair Dye has been used from earliest times by savage tribes, and among civilised nations is still fashionable with certain classes at the present day. The Chinese colour H. with the juice of the *Hibiscus trionum*, but chemical compounds are now in greatest demand. Women may obtain golden tresses by bleaching their H. with hydrogen peroxide, which is also recommended for matching white H. with requisite shades of grey. The most permanent and deepest black is procurable as follows: The H. is saturated with a solution of potassium sulphide and, after drying, dipped in a solution of silver nitrate, the strength of which depends on the colour desired. In the E. henna has long been used as a dye which will produce an auburn colour in the H., but in addition to this use in England it is also followed by a preparation of indigo to dye the H. black. As a brightener of fair H. camomile is effectively used; while para-diamino-benzene, or para-phenylenediamine, is used for the darkening of the H., but should be undertaken only by cautious and skilful hands. See H. S. Redgrave and G. A. Foa, *Blonde or Brunette? A Complete Account of the Theory and Practice of Hair-dyeing*, 1929, and *Hair Dyes and Hair Dyeing. Chemistry and Technique*, 1934; G. S. Miller, *Human Hair and Primate Patterning*, 1931; and Agnes Saville, *The Hair and Scalp*, 1914.

Hair Balls, see GEOLOGY.

Hair-eel, or *Hair-worm*, name applied

to various species of Nematelminthes, and particularly to those of the genus *Gordius* (q.v.) because of their thread-like shape.

Hairs in Plants are natural excrescences from epidermal cells. They are many in kind: root hairs are one-celled tubes; stinging hairs, with a drop of poison on the top, are attached to the nettle genus (*Urtica*), and glandular hairs, the glands being either at tip or base, characterise the sun-dews (genus *Drosera*). Ferns have scaly hairs; bristles are merely hairs made rigid with silica, etc., and the prickles of rose-trees and brambles are hairs grown firm and woody. Externally they grow on any part of the plant, whilst in a few species they cover inner surfaces. The function of hair underground is to absorb food, i.e. water and minerals, and above ground to afford protection from frost, cold, or excessive radiation.

Haiti (Hayti), Santo (San) Domingo, or Hispaniola, is, in the W. Indies, lying in the centre of the chain, and second in size to Cuba. Since the discovery of the is. by Columbus in 1492 there has been no generally accepted designation for it. Columbus called it Espaniola (Hispaniola), 'Little Spain,' whereas the native name for it was Hayti (Haiti), 'Highlands,' and after the first settlement the is. received the name of San Domingo. In 1677, when Spain ceded the W. section to France, the name H. was reserved for the W. part of the I., Santo Domingo for the E., and the whole land was known as Hispaniola. The is. has a length of 400 m., with an extreme breadth of 162 m., and a total area of 28,000 sq. m. It is essentially a mountainous region, and the steep escarpments run right down to the shores. The highest point is Mt. Loma, 10,300 ft., which is situated N.W. of the city of Santo Domingo. It has a coast-line of 1250 m., which has some good harbours, the Samana inlet containing over 30 m. in length. There are four large rivs., the Yaque, the Neyba, the Yuna, and the Artibonite, as well as smaller ones, but the mouths of all are obstructed by shallows, so that they are only navigable for light riv. craft. H. has a wider range of climate than any other part of the Antilles, owing to the great diversity of its relief. The yearly rainfall is abundant, but is badly distributed; the uplands are constantly bathed in dense mists or heavy dews, while other dists. have hardly any rain. The mts. are densely wooded, and such valuable species as rosewood, mahogany, satinwood, pines, cedars, oaks, and ironwood are found. All tropical fruits, too, arrive at perfection, the coffee shrub yielding heavy crops, and no other region is better suited for tobacco and sugar culture. Sev. ore exist in abundance, gold, silver, copper, tin, etc., but the mines are no longer worked. H. is predominantly agric.; except for services such as electric light, automobile depots and garages, and a single large-scale sugar factory there is no industry or outlet for industrial training. The chief agric. products are coffee, cotton, sisal, sugar, tobacco, pineapples, and bananas. Apart from retail trade commerce is confined to the seaports, and

is largely in the hands of foreigners. The retail textile trade in particular is in the hands of Syrians, Palestinians, and other Levantines who are detested by the native ruling classes.

The republic of H. owns the W. part of the is., and has an area of 10,204 sq. m. The old constitution of H. provided for freedom of worship, trial by jury, freedom of the press, etc. H. is now governed under a constitution ratified in 1918, which provides for the creation of a Senate and a Chamber of Deputies. H. is governed under a centralised system provided by the constitution of 1935, to which, however, many amendments were added in 1939, considerably enhancing the powers of the National Assembly. The president is elected by a two-thirds vote of the Assembly, and serves for five years. The Assembly, which has exclusive power to amend the constitution, consists of thirty-seven deputies and twenty-one senators, and, as life members, all ex-presidents who have completed their terms of office since 1930. Deputies are elected for four years by popular vote; senators for six years, eleven of them by being elected by the deputies and ten appointed by the president. The pop., which, in 1936, was estimated at 3,000,000, is almost entirely composed of Negroes (with some 3000 white foreign residents) who speak a patois of Fr. origin known as Creole; but Fr. is the official language. The chief tns. are Port-au-Prince (cap.), with a pop. of 125,000; Cap Haitien (20,000); Aux Cayes (15,000); Gonavas (12,000); Jacmel (10,000); St. Marc (10,000); Port de Paix (8000); and Plaisance, Gros Morno, and La Croix des Bouquets in the interior. There is regular passenger steamship communication with New York, Jamaica, Cuba, and the Canal Zone. There is regular passenger and mail air communication with U.S.A. via Cuba, and with S. America via Santo Domingo, Puerto Rico, and Trinidad. There are freight services between H. and the chief European ports, New York, gulf ports, other is. of the Antilles, the Canal Zone, and Colombia. There are about 135 m. of railway. Wireless telephony was estab. in 1937 between H. and Puerto Rico, Santo Domingo, New York, and Europe. A wireless broadcast station has been erected at Leogane, some 20 m. W. of the cap.

History.—After the discovery of H. by Columbus, who called it Espaniola (Little Spain), adventurers from Europe, drawn by the usual stories of gold, flocked to the is. and in three decades crushed the aborigines out of existence. Negro slaves were first brought into the is. at the opening of the sixteenth century, and in 1517 the importation of 4000 slaves annually was authorised. In 1630 a mixed colony of Fr. and Eng., who had been driven out of St. Kitts (q.v.) and estab. buccaneering hide-outs on Tortuga, settled in H. At the end of the century that part of H. which they occupied was ceded to France by the treaty of Ryswick, and named Saint Domingue by the Fr. The colony prospered until the Fr. Revolution, when the free coloured people demanded that

the Fr. revolutionary principles should apply to them. This was opposed by the Fr., and conflict ensued. In 1791 the mulattoes, disappointed at not being made Fr. citizens, sided with the Negroes against the Fr. in a war which originated in a slave rising. In 1793 the abolition of slavery was proclaimed, and the Eng. having invaded the is., Toussaint L'ouverture, leader of the Negroes, threw in his lot with the Fr., who made him commander of their forces. The Eng. were expelled in 1798, and the Fr. thus became masters of the whole is., which had been ceded to them by the treaty of Basle in 1795. Toussaint in 1801 set up a constitutional form of gov. with himself as president for life, but Bonaparte, with the intention of reintroducing slavery, dispatched a large force to the is. under his brother-in-law, Gen. Leclerc. The Negroes took to the mts. and desultory war followed until Leclerc, having calmed Toussaint into suspending hostilities and invited him to a parley, treacherously sent him to France, where he d. in prison in 1803. The infuriated Negroes renewed the struggle under Gen. Dessalines, a former black slave who had fought under Toussaint, in the same year, but on the approach of an Eng. squadron they agreed to evacuate the is., and in the next year its independence was declared, and the old name H. restored, Dessalines being made governor for life. Later that year he proclaimed himself emperor, but was assassinated in 1806, and two rival chiefs, Christophe and Pétion, set themselves up in the N. and S. respectively, while the Spaniards seized the E. part of the is., naming it Santo Domingo. Pétion d. in 1818, and Christophe took his own life two years later. Gen. Boyer was master of the is. until 1843, but was expelled by a revolution, and in 1844 the people in the E. part estab. the Dominican republic; and from that date the two political divs. have been maintained. In 1915 a treaty was concluded with the U.S.A. for the control of various public services by Amer. officials. In 1931 the U.S. officials in charge of public health, public works, and other services were withdrawn, while the last U.S. marines evacuated H. after an occupation of nineteen years. Until 1947 the financial service was under Amer. control, there being a fiscal representative and his deputy, who were appointed by the president of H. on the nomination of the Amer. president. The Amer. control of the Haitian reserves ended officially on Oct. 1, 1947, when the Haitian Gov. redeemed the outstanding balance of the Amer. loan (1922), amounting to \$5,400,000. See H. P. Davis, *Black Democracy, the Story of Haiti*, 1936; Z. N. Hurston, *Voodoo Gods*, 1939; and J. G. Leyburn, *The Haitian People*, 1941.

Hai yun tau, or Hai Yan Tao, Battle of, was a battle of the Sino-Jap. war of 1894-95. It was fought on Sept. 17, 1894; the Chinese fleet was commanded by Adm. Ting, and the Jap. by Vice-Adm. Ito. The battle resulted in a Jap. victory, by which they obtained the command of the sea in that quarter.

Hajdu-Böszörmeny, see BÖSZORMENY.
Hajdu-Dorog, com. and markt. tn. of Hungary, in the prov. of Hajdúken, situated 20 m. N.W. of Debreczen. Pop. 10,000.

Hajdunána, tn. and magistracy of Hungary, in the prov. of Hajdúken, situated 20 m. S. of Tokay. Pop. 20,000.

Hajipur, tn. of Bengal, India, on the little Ganges at its junction with the Ganges, in the Muzaaffarpur dist. It has considerable water traffic. The old fort here was taken by the imperial troops in 1572 and 1574. Pop. 26,000.

Haji, see HADI.

Hakata, seaport tn. of Japan on the N.W. coast of Kinshin Is., 70 m. N.N.E. of Nagasaki, with manuf's. of silk. It is also noted for its faience ware. Pop. 25,000.

Hake, Thomas Gordon (1800-95), Eng. poet, was b. at Leeds and came of an old Devonshire family. His mother's maiden name was Gordon. He entered the medical profession, studying at St. George's Hospital, London, and at Edinburgh, but he abandoned medicine for literature. He met with a friend in Dante Gabriel Rossetti, who keenly interested himself in his literary efforts. When he was thirty years of age he pub. a prose epic called *Vates*, which was reprinted as '*Valdurno*' in *Ainsworth's Magazine*. His poems were reviewed by Rossetti in the *Academy* and *Fortnightly Review*. His chief productions are *Madeleine* (1871); *Parables and Tales* (1872); *The Serpent Play* (1883); *New Day Sonnets* (1890); and *Memoirs of Eighty Years* (1892). A civil list literary pension was bestowed upon him in 1893, which he lived to enjoy for only two years.

Hake (*Merluccius*), fish of the cod family, which has an elongated body, two dorsal fins, one short and one long, and a very long anal fin. The head is flattened, and the mouth has no barbels. It varies in length from 3 to 4 ft., and has a dark grey back, but is much lighter at the sides and underneath. It is found in the Brit. seas and off the coasts of Europe and E. N. America, and large quantities are consumed as food, the flesh being white and flaky. The spawning season is from March to June, and during these months the fish keep near the bottom and has to be caught by trawl-nets; at other times it is taken by lines.

Hakim-ibn-Allah, see AL-HAKIM-IBN-Otto.

Hakkas ('guests' or 'strangers'), people of China found chiefly in Kwangtung, Fukien, and Formosa. They differ from the Chinese in disposition, appearance, and customs, and speak a distinct dialect. They are very industrious and have great intelligence, and serve as intermediaries between the Chinese and European traders and natives. They were persecuted by the native pop. for over 2000 years, yet at the invasion of Kublai Khan they distinguished themselves by their bravery on the Chinese side.

Hakluyt, Richard (1551 or 1552-1616), Eng. geographer; belonged to a family long settled in Herefordshire, and traceable c. 1260 under the name of Haklitel or Haklitel. Educated at Westminster

School and Christ Church, Oxford, where he held a studentship for seven years after taking his degree. To distinguish him from his cousin and namesake, R. H. the lawyer, he is sometimes referred to as R. H. the preacher. H. the lawyer, a noteworthy but minor character in the Elizabethan story, was head of the family and possessor of the Herefordshire property. H. took holy orders, the only course open to a man of no private fortune, who wished to devote his life to scholarship, and particularly to cosmography. Became prebendary of Bristol, 1586, and seven years later archdeacon of Westminster. His books had a strong practical purpose, being indeed called for by the spirit and necessities of the times. That H. was consciously a publicist and a historian as well as a geographer is evident from his own words: thus in his dedication of a pub. to Raleigh in 1587 he remarks that 'geography is the eye of history' in a context which leaves no doubt that hist. is the primary motive and geography accessory. The Elizabethan period called for work of a publicist and a counsellor for present and future enterprise across the ocean, and the public interest with which H. was concerned was first the revival, and then the advancement of national greatness by means of trade. H. was a forceful advocate of the colonial school of thought and of sea power, though by the latter he meant rather seamen and merchant shipping than warships and guns. In 1582 he pub. *Divers Voyages touching the Discovery of America*. This work was new of its kind, and an admirable piece of work for the end in view, namely to interest intelligent men in the enterprises then about to be undertaken by Sir Humphrey Gilbert; to colonise N. America; for though H. did not give prominence to Gilbert's name or intention, he familiarised the reading public with the idea of Eng. dominion in N. America. In 1584 H. visited London, where Raleigh engaged him to aid his project for colonisation in America, and the outcome was the *Discourse of the Western Planting*, his longest piece of continuous writing, and different in literary character from the editorial work which occupied most of his career. It was first printed in 1587, or 300 years after it was written. In fact the book was directed at the queen, and is worth perusal to-day as a 'fascinating essay in planning, wisely rejected,' but it failed to move Elizabeth. H. went to Paris, where he encountered gibes from Fr. and Portuguese at England's failure to rise to her opportunities. This aroused his feelings as a patriot, and set him to work on a new project of wide scope—a complete collection of all the Eng. travel and explorations by sea and land since the beginning of Eng. hist. The full title, so characteristic of H.'s rolling style, is *The principall Navigation, Voyages and Discoveries of the English nation made by Sea or over Land, in the most remote and farthest distant Quarters of the earth at any time within the compasse of these 1500 yeeres*. It was an epoch-making work, dedicated to Sir Francis

Walsingham, and pub. in 1589; it was superseded by the author ten years later by a much longer work, under an almost identical title. This latter work was in three vols., the first dedicated to Lord Howard, the second and third to Sir Robert Cecil. It was the crown of H.'s career, and has always been highly esteemed. Froude called it 'the prose epic of the English nation.' In the final *Voyages*, indeed, H. created a living book, which is bought and read to this day. It may be said, too, that he is known to-day by this one book, for all his other work was for his own generation, and much of it was forgotten until the rediscovery by modern research. His *magnum opus* was reprinted in 12 vols. (the Glasgow ed.) in 1903-5. It is also in Everyman's Library. His last work was a trans. from the Portuguese, known as *Virginia Richly Valued* (1609). H. is buried in Westminster Abbey. See centenary vol. of H. Society, *Richard Hakluyt and his Successors*, H. Society works, second series, No. XCIII., 1916.

Hakluyt Society was founded in 1816 for printing 'rare and valuable Voyages, Travels, Naval Expeditions, and other geographical records.' The H. S. therefore, described its work as geographical. But its 225 vols. (down to 1946) were to build up, nevertheless, a collection of material whose interest became increasingly historical as the scope of hist. expanded to embrace it. Some 225 vols. have now been issued by the society, which include *Divers Voyages* (1850); *Principall Navigationes* (1903-5); Adm. Bethune's ed. of H.'s *Galvano* was pub. in 1862; Beazley's ed. of *Carpini*, *Itabruquis*, and other medieval texts from H. in 1903. The society also issued Purchas's *Pilgrimes* (1903-5). See centenary vol., *Richard Hakluyt and his Successors*, H. S. works, second series, No. XCIII., 1946.

Hakodate, or **Hakodadi**, seaport tn. of Japan on the is. of Yezo; it was formerly the cap. of the is. until supplanted by Sapporo. It is frequently compared with Gibraltar on account of its position. Before the Second World War there was daily steamboat traffic with Aomori, and also passages to Yokohama, etc. H. is connected by rail with Tokio. The exports are edible seaweed, dried fish, fish manure, fur., sulphur, beans, pulse, etc., but foreign trade was of small account even before the war. Pop. about 207,000.

Hakon, see **HAAKON**.

Halas, or **Kiskunhalas**, tn. of Hungary, situated on Lake Kiskastelo, 75 m. S.S.E. of Budapest. There is a trade in wine. Pop. 19,000.

Halberd, or **Halbert**, weapon, which consists of a combined spear and axe, i.e. a wooden staff about 5½ ft. long, surmounted by an axe-blade, the end opposite the staff furnishing a spear. This weapon was much used during the fifteenth and sixteenth centuries, and while similar in make, Hs. varied a little in shape; some blades were extremely narrow, while others were flat, broad, and double-edged. The H. originated in Germany and Scandinavia, and later was used by the Swiss,

Fr., and Eng. Now the II. is carried by women of the guard on ceremonial occasions, being a mere symbol of authority.

Halberstadt, tn. of Saxony, Germany, situated at the base of the Harz Mts., on the R. Holzemmo, a trib. of the Bode, 30 m. S.W. of Magdeburg. It is extremely quaint; many houses date from the fifteenth century and are decorated with fine carving. The cathedral (thirteenth to fifteenth century) is Gothic and, viewed from the interior, is particularly lofty and majestic. Before the Second World War the tn. had manufs. of gloves, sugar, etc., and there are railway works, paper mills, and breweries. II. was heavily raided by allied bombers in daylight on Feb. 22, 1944. Pop. 50,000



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J. B. S. HALDANE

Halcyon Days, see ALCYON.

Halcyone, see ALCYONE.

Halcyonidae, see KINGFISHERS.

Haldane, James Alexander (1768-1851), Scottish preacher, b. at Dundee. When a man he settled in Edinburgh (1794), and estab. the Society for Propagating the Gospel at Home (1797). In this work he was aided by his brother, Robert, and friends. He seceded from the Church of Scotland, and founded in Edinburgh in 1798 the first Congregational church in Scotland, and became its pastor. He wrote numerous controversial treatises, but more important are his itinerant evangelistic tours throughout Scotland. His brother built for him a great 'tabernacle' in Leith Walk, Edinburgh. See A. H., *Lives of Robert and James A. Haldane*, 1852.

Haldane, John Burdon Sanderson, Brit. man of science; b. Nov. 5, 1892; son of Prof. John Scott H. Educated Oxford Preparatory School; Eton; and New College, Oxford (where he obtained a first in greats, or classics). Served with the Black Watch in First World War (France and Iraq); twice wounded; captain, 1915. Fellow of New College, 1919-22. Dunn reader in biochemistry, Cambridge Univ., from 1922 to 1933, when he left Cambridge to become prof. of genetics at London Univ., a post which he held until 1937, when he was elected the first prof. of biochemistry at Univ. College. Head of genetical dept., John Innes Horticultural Institution, since 1927. In 1930 he became Fullerian prof. of physiology at the Royal Institution. He has attained celebrity by uniting scientific attainments with a wonderfully facile literary style. Most of his technical writings—on physiology, natural selection, etc.—are in the *Journal of Physiology*, the *Journal of Genetics*, and the *Proceedings of the Cambridge Philosophical Society*. The general public has read with interest *Dædalus, or Science and the Future* (1924); and *Callinicus: a Defence of Chemical Warfare* (1925), in the To-day and To-morrow Series; a book of short papers entitled *Possible Worlds* (1927); and *Science and Ethics* (1928). He has written, in collaboration with Julian Huxley, *Animal Biology*, a students' book (1927). Later publs. include *Enzymes* (1930); *The Causes of Evolution* (1933); *The Marxist Philosophy and the Sciences* (1939); *New Paths in Genetics* (1941); and *Science Advances* (1948). He is also well known for his broadcast talks.

Haldane, John Scott (1860-1936), Brit. scientist, b. in Edinburgh, brother of Viscount H. (q.v.). Studied physiology at various univs., and became reader in that subject at Oxford. His most valuable achievements in research were in the principles of respiration. Expert on problems of atmosphere in mines. He devised the H. gas-analysis apparatus.

Haldane, Robert (1764-1842), Scottish propagandist, brother of James H., b. in London. He was educated at Edinburgh Univ., and spent some years in the navy, being present at the relief of Gibraltar, but in 1783 retired to Airthrey, near Stirling. Here he devoted himself to the advancement of Christianity, and in 1797 founded, with his brother and others, the Society for the Propagation of the Gospel at Home. In Montauban in 1817 he procured the printing of two eds. of the Bible in Fr., and circulated a Fr. trans. of his *Evidences and Authority of Divine Revelation* (one of his most important works). He returned to Scotland in 1819. He also wrote *The Authenticity and Inspiration of the Scriptures* (1828); and *Exposition of the Epistles to the Romans* (1835).

Haldane of Gioan, Richard Burdon Haldane, Viscount (1856-1928), Brit. Liberal statesman and critical philosopher, b. in Edinburgh. He was educated at Edinburgh Academy, and there, leading a life of the most Spartan simplicity, laid the foundations of that profound scholarship

which made his subsequent career so distinguished. He graduated at Edinburgh Univ., where he gained every possible distinction in philosophy and acquired a good knowledge of science and mathematics, and then at Göttingen, where, as the pupil of Lotze, philosophy became his governing passion. He was called to the Bar in 1879, becoming Queen's counsel in 1890. He entered Parliament in 1885 as member for Haddingtonshire, and retained his seat until 1911. His entry into Parliament was almost contemporaneous with that of Asquith and Lord Grey of Fallodon with both of whom he was soon on terms of close friendship. Gladstone was then Prime Minister but H., whose legal activities precluded continuous attendance at the House did not at that time attract the Premier to the same degree as did his two friends, but three years later when the Conservatives were in office, his sound judgment on educational administration coupled with his support, though a Liberal, of Balfour's unsuccessful attempt to solve the Rom Catholic Univ. question (*q.v.*), proved his worth as adviser unbiased by faction or prejudice.

He was eminent alike in law, politics, and philosophy and exercised a more enduring influence on contemporary institutions than any man of his time. At various periods of his career he aroused strong antagonism, as might be expected of a thinker and statesman whose opinions went beyond mere party bounds and who like Aquinas realised that democracy without true leadership could degenerate into the rule of the mob. Unlike many successful statesmen who have used the Bar as a stepping stone to politics H. also left his mark as a lawyer his judgments in the House of Lords and in the Privy Council affording many notable precedents. In this sphere he rendered much assistance in the thorny problem between the gov's of Canada and Newfoundland concerning the Labrador boundaries, while as a law reformer he had a large share in rationalising the law of real property. During the South African war 1899-1902, he was conspicuous as a liberal imperialist, being vice-president of the Liberal League in 1901. In that war as in the crises of Home Rule and Irish Reform Liberal cohesion was sorely tried but H. always pursued an independent line, and it is probable that his views better reflected the opinion of the nation than those of his colleagues. He refused to join in Campbell-Bannerman's condemnation of the gov's action in the South African war, and strongly opposed Milner's reactionary proposal, later on to suspend the constitution of the colony. With the Education Bill of 1902 however Liberal unity was restored and intensified by their opposition to Chamberlain's tariff reform proposals of 1903 in which opposition H. played an important part. But the great landmark in his political career was his appointment in 1905 as secretary of state for war. His great work in that capacity was the supplementing of the reforms of Cardwell (*q.v.*) by the creation of an expeditionary

force, the substitution of the territorial force (now army) for the old volunteers and militia, and the formation of a general staff on the lines recommended by the Fisher Committee—reforms which not only terminated a period of drift and indecision, but so reorganised and modernised the military forces of the nation as to enhance beyond all recognition its chances of meeting the subsequent crisis of the First World War. Some ex parte have alleged that H. was wrong in cutting down the artillery to effect these reforms, but the success of the expeditionary force in



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1914 in fact of colossal difficulties does not justify this contention. Less sanguine if more flattering is the attempt made in the *Life of Henry Wilson* (chief of the general staff in the later years of the war and afterwards) to credit Wilson with the greater part of H.'s reforms but evidently without any striking success, and the reputation of H. as the greatest war minister since Cardwell seems securely established. A detailed account of his part in advising the Cabinet on the military measures necessary to meet a possible world crisis is to be found in *British Documents on the Origins of the War* (ed. by Gooch and Templer) where it will be seen that the Moroccan imbroglio laid by 1905 already opened the eyes of the Brit. Govt. to the possibility of a world crisis with Germany. H.'s military reforms were probably the utmost that could have been accomplished on the basis of the voluntary system, for he was opposed to the champions of compulsory service, in which attitude he was supported both by the general staff and by the general body of opinion in the country. Possessing an exceptional knowledge of Germany H., in the period before the First World War, was the chief ministerial adviser to the foreign secretary in questions appertaining to that country, and his cautious sympathy with German ideals and institutions tempered the pronounced

anti-Teutonic attitude of the departmental advisers. This sympathy for Germany became crystallised in the famous phrase in which he described the country as his 'spiritual home,' a phrase which brought down on him unmeasured and ill-judged condemnation during the war, an outcry which in no way weakened his goodwill towards Germany, as may be seen in his *Before the War*, pub. in 1920. H. at all times worked hard for the preservation of concord between Great Britain and Germany, and his visits to Berlin in 1906 and 1912 did temporarily allay mutual suspicions. When the First World War broke out H. gave the gov. his unqualified support; but, on the formation of the first Coalition Gov. in 1915 the Conservatives demanded his exclusion from office, and Asquith yielded to the demand, a surrender which permanently cooled the friendship between the two statesmen. The immediate result of the severance was, however, to accentuate H.'s natural tendency to independence of judgment, and, after the war, he transferred his services to the Labour party, becoming their first lord chancellor, in 1923, this being the second time he had occupied the woolsack, the former occasion being when he succeeded Lord Loreburn in 1912. His position was, however, anomalous, and after the defeat of his party in 1924 it is doubtful whether he would have again resumed office, though he remained leader of the Opposition in the Lords. He was rector of Edinburgh Univ. and chancellor of the univ. of Bristol before the war. After the war, when the Goethe Society was revived, he succeeded Sir Adolphus Ward in the presidency.

As a philosopher, H. initiated no new school of thought, and was hardly a constructive philosopher in any sense of the term. A confirmed adherent of the Hegelian metaphysic, his philosophical reputation rests partly on his interpretation of Hegelian thought, and partly on his own doctrine of the fundamental character of knowledge and of degrees of knowledge and reality. From 1902 to 1904 he was Gifford lecturer in St. Andrews Univ., and in 1903 pub. *The Pathway to Reality*, his most important work, the thesis of which is his belief that reality is knowledge—a conviction which he attempted, later, to connect with Einstein's theory of relativity. His other chief works on philosophy are *Essays in Philosophical Criticism* (in collaboration with Prof. Seth, 1883); *The Philosophy of Humanism* (1922); *Human Experience* (1926), a summary of his opinions, which was widely read; and *Affirmations* (1928), a series of pamphlets on his doctrine of knowledge. Other works, *Life of Adam Smith* (1887); a trans. of Schopenhauer's *World as Will and Idea* (in collaboration with J. Kemp, 1883); and *Education and Empire* (1902). He was made Viscount H. of Cloan in 1911, being the first to hold that title. See his autobiography, 1920, and F. Marrie, *The Life of Viscount Haldane of Cloan*, 1939.

Halde, Jean Baptiste du (1674–1743), Fr. Jesuit, b. in Paris. For many years he

was occupied in adapting the letters and reports of the missionaries for pub., and from this source derived his material for his great work, *Description géographique, historique, etc., de la Chine*, pub. in 1735. This book has been trans. into many languages, including Eng., and was long regarded as the standard work of reference on the subject of which it treats.

Halden, see FREDERIKSHALD.

Hale, Edward Everett (1822–1909), Amer. Unitarian minister and author, b. at Boston, U.S.A., and graduated at Harvard (1839). In 1856 he became pastor of the S. Congregational Society in Boston, a Unitarian church, only resigning in 1899. Though he regarded his Christian ministry as his true work in life, he yet found time to contribute voluminously to the periodical press, to edit magazines and newspapers, and to be the author of over sixty vols. of fiction, juvenile stories, hist., biography, and sermons. His fame as a writer rests chiefly on his celebrated short story *The Man without a Country*, which, contributed to the *Atlantic Monthly* during the darkest moments of the Civil war, is said to have done much to help the cause of the Union in the N. The detailed realism of style he employed in this and in other of his non-romantic stories, such as *Ten Times One is Ten* (1870), induced in many readers the belief that the narrative was a record of sober fact. The last-named story, centring on its hero Harry Wadsworth and his motto 'Look up and not down,' led to the formation in some parts of the country of Look-up Legions and Harry Wadsworth clubs—all indicative of the strong influence his personality always exercised, especially on New England life. His other writings include *Franklin in France* (1887–88), written in collaboration with his son, and *James Russell Lowell and his Friends* (1899), both these works being the fruit of much painstaking research. A collected ed. of his works appeared in 1898–1901. See E. Hale, *The Life and Letters of Edward Everett Hale*, 1917.

Hale, George Ellery (1868–1938), Amer. astronomer, b. at Chicago, Illinois, U.S.A. He organised the Kenwood observatory and, while there, invented an instrument for photographing the sun in certain aspects of its light. In 1892 he was made assistant prof. of astronomy at the univ. of Chicago, and organised and became director of the great Yerkes observatory. In 1904 he left Chicago, and organised the even bigger observatory at Mt. Wilson, California, and was connected with it as director from that date until 1923. He became noted among his peers as a specialist in solar physics, particularly solar vortices and solar magnetic fields. Awarded the Copley medal of the Royal Society, and numerous other foreign distinctions. Among his best-known books are *The Story of Solar Evolution* (1908); *The Depth of the Universe* (1924); *Beyond the Milky Way* (1925); *Signals from the Stars* (1930); and numerous books and papers on spectroscopy and solar and stellar physics.

Hale, Horatio Emmons (1817-96), Amer. lawyer and philologist, b. in New Hampshire. Graduated at Harvard in 1837. His great work, *Ethnology and Philology* (1846), the 6th vol. of the reports on Charles Wilkes's exploring expedition of 1838-42 (see WILKES, CHARLES), contains a large amount of philological data and is said to have laid the foundations of the ethnography of Polynesia. He also ed. *The Iroquois Book of Rites* (1883).

Hale, Sir Matthew (1609-76), Eng. lawyer and judge, was b. at Alderley in Gloucestershire. He was called to the Bar in 1637, and in 1653 became judge in the court of common pleas. In 1655 he sat in Cromwell's Parliament, but on the Restoration (1660) he was made chief baron of the exchequer, and received the order of knighthood. In 1671 he was made lord chief justice, but resigned in 1676 owing to ill-health. It is significant that while H. was neither a good speaker nor a bold pleader he rose to the head of his profession, but he owed his success to the fact that he steered a middle course, realising that a judge and lawyer can best serve his country who holds himself aloof from partisanship. He wrote *History of the Common Law of England* (1713); and *History of the Pleas of the Crown* (1736). He was also the author of *Contemplations, Moral and Divine* (1676), containing didactic discourses, together with seventeen effusions in the heroic couplet, and numerous MSS. on legal and religious subjects, which were pub. after his death.

Hale, par., tn., and vil. of Cheshire, England, about 2 m. S.S.E. of Altringham and 7 m. W.S.W. of Stockport. The par. has an acreage of 3724, and contains the Altringham Girls' Home, estab. in 1883, which has accommodation for sixty girls. Pop. 13,200.

Haleb, see ALEPPO.

Halebid, vil. of Mysore, India, and the site of the ant. Dornasamudra. There are the ruins of two temples which were never completed, but which are regarded as masterpieces of Hindu architecture.

Halec, see CANEA.

Hales (Doctor Irrefragabilis), see ALEXANDER OF HALES.

Hales, Alexander, see ALESIUS.

Hales, John (1581-1656), Eng. scholar and theologian, often called 'the Ever-memorable,' was b. at Bath. He was educated at Corpus Christi College, Oxford, and in 1612 became public lecturer on Gk. to the univ. He was present at the Synod of Dort in 1618, and his reports are included in his *Golden Remains* (1659). In 1636 he wrote a tract, *Schism and Schismatics*; this fell into the hands of Laud, who made H. one of his chaplains, and obtained for him a canonry at Windsor. In 1642 he was deprived of his office, and retired to Eton. See H. J. Elson, *John Hales of Eton*, 19th.

Hales, Stephen (1677-1761), Eng. philosopher, physiologist, and inventor, b. a Beckesbourn; educated at Cambridge and Oxford; was curate of Teddington from 1709. He invented artificial ventilators and other contrivances. His valuable researches in vegetable physiology were

pub. in *Vegetable Staticks* (1727), and in animal physiology in *Statistical Essays* (1733). He also wrote *Philosophical Experiments* (1739). He was a F.R.S. in 1718. Copley medallist in 1739, and vice-president of the Society of Arts in 1755.

Halesowen, par. and mrkt. tn. of Worcestershire, England, situated in the Oldbury parl. div. The par. has an acreage of 12,439, and the tn. lies in a fertile valley, watered by the Stour and its feeders. There are extensive iron and steel works and manufs. of anchors, gun barrels, perambulators, agric. implements, etc. Wm. Shenstone, the poet, is buried here. The ruins of a Premonstratensian abbey, founded in 1215, are to be seen S.W. of the tn. Pop. (dist.) (1931) 36,100; (par.) 5000.

Halesworth, par. and mrkt. tn. of Suffolk, England, situated in the Blyth, 27 m. N.E. of Ipswich. There were a few breweries. Pop. 2100.

Halévy, Elie (1870-1937), Fr. historian, b. at Etretat, Seine-Inférieure, France, son of Ludovic H. Educated in Paris, at the Ecole Normale Supérieure and the Lycée Condorcet. In 1898 he became prof. at the Ecole Libre des Sciences Politiques. In 1896 appeared his *La Théorie platonicienne des sciences; La Formation du radicalisme philosophique* (3 vols.) in 1901-4. He is, however, best known as a student of Eng. hist. and institutions and as the author of *Histoire du peuple anglais au XIX^e siècle* (1913, 1923; trans. 1937, 1949).

Halévy, Fromental (Jacques François Fromental) (1799-1862), Fr. operatic composer of Jewish descent; entered Paris Conservatoire at the age of eleven, and became the pupil and friend of Cherubini, by whose musical purism he was greatly influenced. After a few still-born early works he first gained recognition with the excellent opera, *La Juive* (1835), adding later to his reputation by *La Reine de Chypre* (1841); *Iromelus Bound* (1849); and *The Tempest*, written the following year for a London production. In 1851 he was appointed secretary to the Académie des Beaux-Arts. His music, which consists almost entirely of lyrical dramas, is brilliant and charming, rather than great or profound; he has been called the Fr. Verdi. Sainte-Beuve relates that H. was a man of genial disposition and wide culture, an elegant poet, and an accomplished linguist. See lives by L. Halévy, 1862, and A. Pougin, 1863.

Halévy, Joseph (1827-1908), Fr. Semitic scholar, was b. at Adrianople. He wrote numerous books on Semitic, Berber, Indian, and Babylonian subjects, and for some time was prof. of Ethiopian at the Ecole des Hautes Études in Paris. In 1868 he made a journey to N. Abyssinia to study the religion of the Jewish Falashas, and in 1869 went to Yemen in quest of Sabean inscriptions, collecting as many as 800. His chief works are *Mission archéologique dans le Yémen* (1872); *Etudes berbères* (1875); *Nouvel Essai sur les inscriptions proto-arabes* (1903); *Préfendus mots assyrien en sumérien* (1905); and

Précis d'allographie assyro-babylonienne, 1912.

Halévy, Léon (1802-83), Fr. man of letters, brother of Fromental H., the composer. He wrote *Résumé de l'histoire des Juifs* (1827-28); *Poésies européennes* (1837); *Recueils de fables* (1844); *La Grèce tragique* (1845-61); besides a life of his brother, and sev. dramatic pieces.

Halévy, Ludovic (1834-1908), Fr. dramatist, was *b.* in Paris. From his early years he was connected with the stage, his uncle Fromental H. being associated with the opera, and his father Léon H. being a dramatist. He became famous by the production of his *Orphée aux enfers* (1858), a musical parody (a trans. of which was produced at His Majesty's Theatre, London, in 1911, by Treo). About 1860 he met Henri Meilhac, and the two collaborated, producing operettas, farces, and comedies. Their works met with extraordinary success, both being endowed with wit, humour, and observation of character, but they owed a great part of their success to the music of Offenbach, as indeed did his *Orphée aux enfers*. The most celebrated were *La Belle Hélène* (1861); *Barbe-bleue* (1866); *La Grande Duchesse de Crœstä* (1867); and *La Perichole* (1868). Their attempts at more serious drama were not so successful, but *Froufrou* (1869), made a great hit. H. also made a name as a novelist, and was elected to the Fr. Academy in 1884, his *L'abbé Constantine* (1882) being a great favourite. Other works of his are *Criquette* (1883); *Mariette* (1883); *Kiki-kiki* (1892); *La Famille Cardinal* (1907); and *Deux Mariages* (1883).

Hale-White, Sir William (1857-1949), Eng. physician and historian of medicine, b. in London, son of Wm. Hale White (q.v.), better known as 'Mark Rutherford,' the novelist. Entered Guy's Hospital as a student in 1875; ten years later he was appointed assistant physician there; he was physician from 1890 to 1919, when he retired, and was made consulting physician. From 1886 to 1893 he was one of the joint editors of *Guy's Hospital Reports*, and contributed many papers to that journal over a period of fifty years. As president of the Fellowship of Medicine (1927-32) and as founder of the *Post-Graduate Medical Journal* he did much for medical education. He was president of the Association of Physicians of Great Britain and Ireland (1930-31), and one of the original editors of its journal. He wrote numerous books on medicine, but the work by which he is so well known to generations of students and practitioners is his handbook of *Materia Medica, Pharmacy, Pharmacology, and Therapeutics*, the first ed. of which appeared in 1892, and the 26th ed. in 1944. His other works include *A Text-book of General Therapeutics* (1889); *A Text-book of Pharmacology and Therapeutics* (1901); and *Common Affections of the Liver* (1908). In 1923 he pub. a trans. of selected passages from Laennec's *Treatise on Mediate Auscultation*, with a biography, in the series of *Medical Classics*, ed. by Dr. Charles Singer. During his retirement he devoted his leisure to the

study of medical hist. and pub. *Great Doctors of the Nineteenth Century* (1935); and a book on *Keats as Doctor and Patient* (1938).

Halfa, see ENPARTO GRASS.

Halfa, see under WADI HALFA.

Half-blood, related through one parent only. When two persons are *b.* of the same father, but not of the same mother, they are said to have a consanguinean relation one to the other, but if they have the same mother and not the same father their relationship is said to be uterine. In the succession to real or landed property a kinsman of the H. inherits next after a kinsman of the whole blood in the same degree, and after the issue of such kinsman when the common ancestor is a male, but next after the common ancestor when such ancestor is a female. So that brothers consanguinean inherit next after the sisters of the whole blood and their issue; and brothers uterine inherit next after the mother. But in the succession to personal property relatives of the whole and the half blood were on an equal footing. Under the new law, by which the rules of succession to both real and personal property are assimilated, relatives of the whole blood obtained priority over those of the half blood; thus, for example, if a person dies intestate, leaving surviving him brothers and sisters of the whole blood and a brother of the half blood the latter is excluded altogether and the estate is distributed equally among the others (Administration of Estates Act, 1925). It may be noted that in Canada kinsmen of the half blood inherit equally with those of full blood.

Half Dome, or South Dome, granite mt. of California, situated near the E. end of the Yosemite valley. It is separated from N. Dome by the canyon of the Tenaya Fork, and rises 3800 ft. above the sea level.

Half-pay, allowance given in the Brit. Army (corresponding to the Fr. *demi-soldé*) to commissioned officers who are not actively employed, and is most commonly granted to those who have been promoted to higher rank when there is no vacancy for them. Officers, as a rule, can be put on H. at their own request or if suffering from illness, but can only continue on the list for five years, after which period they must resign, permanent H. having been abolished in 1884. They are then placed on 'retired pay,' and are liable to be called upon to serve in case of great emergency, or when the country is in peril.

Half-tone Process, see under PROCESS WORK.

Haliartus, anc. tn. of Greece in Boeotia, situated on a hill overlooking Lake Copais. It was burnt down by Xerxes (480 B.C.) and rebuilt. In 395 B.C. the Thebans defeated Lysander in front of H. It was finally destroyed in 371 B.C. by the Romans.

Haliburton, Thomas Chandler (1796-1865), author, was *b.* in Nova Scotia, Canada. Called to the Bar there, he eventually rose to be chief justice, to which high office he was appointed in 1828. He retired in 1856, when he came to England, where he resided until his

death. He was the author of many books, including histories of his native prov.; but it is for his writings under the pseudonym of 'Sam Slick' that he became best known. The three series of *The Clockmaker, or Sayings and Doings of Sam Slick of Slickville* (1837-40), were reprinted in England and attracted much attention. His wit was racy, and the rigour of his outspokenness was only gilded by the humorous coating under which he disguised it. There is a memoir by F. Blake Crofton (1889).

Halibut, or **Halibut**, so called because it was commonly eaten on holy days, is the name given to *Hippoglossus vulgaris*, a species of *Pleuronectidae*, or flat-fish (*q.v.*). It has both eyes on the right side, which is brown with deeper coloured markings, the under side being white; the mouth is symmetrically placed and very capacious; the body is smooth and covered with small oval scales. The H. attains considerable size, specimens 7 or 8 ft. in length being common on the coasts of N. America, but the flesh of smaller fishes is more highly esteemed; these are abundant on all the Atlantic coasts, though infrequent in the Eng. Channel.

Halicarnassus, ant. Gk. city of Asia Minor, on the site of the modern Budrum, situated on the S.W. coast of Caria on the Ceramic Gulf. Originally it was built partly on the is. of Zephyria, but the latter became united to the mainland during the course of time, and the city consequently was extended. It was founded by the Dorians, who settled there from Trezen, and was in 334 B.C. almost destroyed by the Macedonians. In 352 B.C. the Mausoleum—the tomb of Mausolus—was erected which was regarded as one of the seven wonders of the world. It consisted of a basement 142 ft. by 92 ft., a pedestal, Ionic columns, a pyramid, and a chariot group. Herodotus and Dionysius were b. in the city.

Halicore, see DUGONG.

Halicz, see GALICIA.

Haliez, or **Galicz**, tn. of E. Galicia, situated on the Dniester, 48 m. W.S.W. of Tarnopol and 70 m. S.S.E. of Lvov. Salt and soap are manufactured and a trade in lumber is also carried on. The tn. and fort of H. were bitterly contested in the First World War, falling to Gen. Brusilov (*q.v.*) on Aug. 27, 1914, in the Galician campaign. After being retaken by Austro-Ger. forces H. again fell to the Russians in July 1917, only to be taken again later that month by the Austro-Ger. armies in the course of the general debacle of the Russian armies during the initial stages of the Russian Revolution. In the Second World War the tn. fell to the Russians in their great drive of 1943-44 on Lvov and other strongholds. Pop. 5000.

Halidon Hill, hill situated 2 m. N.W. of Berwick-on-Tweed, England. It is noted for a battle fought, in 1333, between the Eng. and Scots, when the latter were defeated.

Halifax, Charles Montagu, Earl of (1661-1715), Eng. statesman and poet, b. at Horton in Northamptonshire. He was educated at Westminster School and Trinity College, Cambridge, and assisted

Newton in forming the Philosophical Society of Cambridge. In 1687 he wrote (with Matthew Prior) *The Country Mouse and the City Mouse* (a parody on Dryden's *Hind and Panther*), which secured him a great reputation. In 1689 he entered Parliament as member for Maldon; in 1692 was made lord of the treasury and commenced the national debt by raising a loan of £1,000,000. In 1694 he introduced a Bill for the incorporation of the Bank of England, following out Paterson's idea, and was for this made chancellor of the Exchequer. In 1695 he took measures to remedy the currency, and in 1697 was made first lord of the Treasury. In 1698 and 1699 he acted as one of the council of regency during the king's absence from England, and in 1699 accepted the auditorship of the Exchequer. He was impeached for malpractices in 1701 and 1703, and continued out of office during the reign of Queen Anne, but became first lord of the Treasury on the accession of George I. He is especially famous as a minister of finance.

Halifax, Edward Frederick Lindley Wood, third Viscount of Kirkby-Underdale, E. Riding, Yorkshire (b. 1881). Brit. statesman, son of second viscount H. Educated at Eton and Christ Church, Oxford. Conservative M.P. for the Ripon div. of Yorkshire in 1910. Between 1921 and 1926, the year in which he was appointed viceroy of India and made Lord Irwin, he held successively the offices of parl. under-secretary for the colonies, president of the Board of Education, and minister of agriculture. Privy councillor, 1922. As viceroy of India he favoured the gradual development of Indian constitutional progress to dominion status, and endeavoured to reconcile Hindu and Moslem differences by promoting a conference in 1927. In 1929 he declared publicly in India that dominion status for India was the goal of Brit. policy in India, having, in England, previously submitted to the party leaders a statement that this was implicit in the declarations already made in India. Two years later he concluded a pact with Gandhi (*q.v.*). After his return from India he was appointed in 1932—having in that year succeeded to the title of Viscount H.—president of the Board of Education and, from 1935, was leader of the House of Lords. Held successively the offices of war secretary, Lord Privy Seal, and Lord President of the Council. In Nov. 1937 he visited Hitler at Berchtesgaden to discuss Anglo-Ger. relations, but nothing came of the visit, Hitler being in a moody unresponsive frame of mind. On the resignation of Mr. Anthony Eden (*q.v.*) H. was appointed foreign secretary (Feb. 25, 1938) in the gov. of Mr. Neville Chamberlain, and he held that post in the gov. of Mr. Winston Churchill until Dec. 1940, when he succeeded Lord Lothian as ambas. in Washington. As foreign secretary it fell to him to declare Britain's foreign policy. Although in Oct. 1938 he declared that the Brit. Gov. must lose no opportunity of helping forward the results of the personal contacts estab. between Germany, Italy,

France, and Great Britain at Munich, he made it clear, five months later, after Germany had invaded Czechoslovakia, and annexed Memel that force would be met by force and recalled that 'history recorded many attempts to dominate Europe, all ending in disaster to those who made them.' His speeches as foreign secretary before the outbreak of war and subsequently, admirably express the British moral conscience, upholding the sanctity of treaties and the pledged word. See A. C. Johnson, *Viscount Halifax*, 1941, and S. Hodgson, *Lord Halifax*, 1941.

Halifax, George Montagu, second Earl of (1716–71), assumed the surname Dunk on his marriage, in 1741, to Anne Richards, the heiress of Sir Thomas Dunk. In 1748 he was made president of the Board of Trade, and helped to found Halifax, Nova Scotia. In 1757 he entered the Cabinet, and in 1761 was appointed lord-lieutenant of Ireland, and First Lord of the Admiralty. In 1762 he became secretary of state for the N. dept. under the earl of Bute.

Halifax, George Savile, first Marquess of (1633–95). Eng. statesman, b. at Thornhill, Yorkshire. In 1650 he was elected member for Pontefract, and in 1658 was created Baron Savile of Eland and Viscount H. He took an active part in passing through Parliament the Test Act of 1673; in 1680 was instrumental in getting the Exclusion Bill rejected, and in 1688 took the popular side on the occasion of the trial of the bishops. On the accession of William III, he was made Lord Privy Seal, and had considerable influence. H. was a great statesman and consistent in his principles, although he was not appreciated in his own day, earning for himself the title of 'Trimmer,' which he defended in *Character of a Trimmer* (circulated in MS., 1685, and first pub. in 1688).

Halifax, municipal co. and bor. of W. Riding, Yorkshire, England, situated on the Calder, 7 m. S.W. of Bradford, 16 m. S.W. of Leeds, and 194 m. N.N.W. of London. It is served by the L.N.E. and L.M.S. sections of Brit. Railways. It ranks with Bradford, Leeds, and Huddersfield in the woollen and worsted manuf.; and in the vicinity are important coal-mines and iron and steel works; stone is also quarried. The tn. is chiefly modern, and contains some noteworthy buildings. The present par. church is the third that has stood upon the same site—once the centre of the tn., but now solitary and apart through successive waves of the pop. flowing away in the course of development of trade. Of the first church, built by the Cluniac monks of Lewes, c. 1120, some Norman fragments survive. A second and larger church was built c. 1290, and three of the windows of that building remain. The foundations of the present church was probably laid c. 1450, and took over forty years to build, but the last of the chapels was not completed until a century later. The Rokeby chapel, built in the reign of Henry VIII., is worthy of the old church. The Jacobean pews and the elaborately carved font cover are among the treasures of the church and the

clear windows in the choir, dating from the Commonwealth, are unique. Most of the other Anglican churches of H. were erected in the nineteenth century. Holy Trinity church belongs to the Classic style of the eighteenth century, but it has been restored later. One of these modern churches, All Souls, is among the masterpieces of Sir G. Gilbert Scott. Rom. Catholicism and the prin. Nonconformist denominations are represented by many churches. The tn. hall was designed by Sir Charles Barry, the architect of the Houses of Parliament. It is in the It. style, and the upper portion of the tower is richly decorated by groups of figures representing Britannia supported by figures of Science and Art. It was opened in 1863 by the Prince of Wales (King Edward VII.). Belle Vue, the residence of the late Sir Francis Crossley, was acquired by the corporation of H. in 1889 and adapted for a public library. The Akroyd branch library is at Bankfield, former residence of Edward Akroyd, also a noted benefactor of the tn. The Belle Vue museum was founded in 1897. Its reorganisation on modern lines, begun in 1937, was interrupted by the war. The Bankfield museum and art gallery in Akroyd Park, was opened in 1887; its main interests are textiles, art, and ethnography. Shibden Hall, in Shibden Park, now scheduled as an ant. monument, is a very fine 'period' museum, and the hall is a notable example of the old timbered houses of England, containing seventeenth-century furniture and a valuable collection of MSS. relating to the dist., early printed books and court rolls. The bor. market was erected by the corporation at a cost of £100,000. The Prince's Arcade, at the junction of Woolshope and Market Street, was opened in 1931. The Royal Infirmary of H. dates back to 1807, when it was founded as a dispensary. It now possesses out-patient, X-ray, rehabilitation, and pathological depts., and two operating theatres. One of the most prominent buildings is Walhouse's Tower (270 ft.), built in 1871 of stone from nearby quarries and intended for use as a chimney, but kept as a tower and landmark. The war memorial in front of the central library resembles the Whitehall cenotaph. It may be mentioned here that H. suffered comparatively little air-raid damage in the Second World War. The many parks and open spaces include Shroggs Park, overlooking Wheatley Valley; Savile Park (formerly Skircoat Moor), with Albert Promenade overlooking Conley Valley, the People's Park, presented by Sir Francis Crossley, W. View Park, Shibden Hall and Park, Akroyd Park, Belle Vue Park, Manor Heath, and numerous recreation grounds, and the Jerusalem Farm camping site, at Luddenden Dene, a local beauty spot.

Industries.—Textiles and allied trades are the chief occupations of the inhabs., a feature of the tn., viewed from the surrounding hills, being the large number of mill chimneys. The woollen trade was in existence in H. in the latter part of the thirteenth century, local records for that period referring to 'websters' (weavers),

'walkers' (fullers), and 'liltsters' (dyers) as carrying on the trade. Later H. became the centre of the W. Riding for piece goods, which were taken by the weavers to the Piece Hall for disposal. When the railways were made H., unfortunately, was not placed on the main line, and Bradford consequently became the centre of the textile trade so far as markets were concerned. The carpet manufacturing firm of John Crossley & Sons is the largest industrial concern in H. Blouse, underclothing, and skirt manufacturing is also a well-developed industry. H. is an important centre of the machinetoool making industry, amongst the specialities being radial drilling, slotting, planing, boring, and shaping machines. As the general trades of the tn. are greatly varied, so are the branches of the engineering section. Wire manufacturers make specialities of telegraph wire, patent steel, and plough rope wire, and steel card and head wire. The tn. also has a reputation for its fireclay products. The H. Chamber of Commerce was founded in 1862.

History.—In the Norman era H. was a very small hamlet in the manor of Wakefield, ruled by the Warrens, whose castle was at Lewes in Sussex. Earl Warren had bestowed the par. church of H. to the priory of St. Pancras at Lewes. The par. of H. was one of the largest in the country, embracing the Upper Calder Dale from Brighouse to Todmorden, with its trib. valleys and surrounding moorlands. The townships of H. and Heptonstall were included in the gift to the priory. There is evidence that the cloth trade was indigenous, and estab. here long before the Flemish weavers came to England. But the weavers' guilds of York and other medieval cities endeavoured to monopolise the cloth trade and controlled the export of textiles. Hence the wares of H. men had to be sold 'in the fairs of the country, and in the fifteenth century the par. of H. produced more cloth than any other place in the W. Riding; and the large Perpendicular church of H. is a monument to the piety and wealth of H. people of those days. A section of the main street in H. is called 'Wooldshops,' once the site of the wool-staplers' warehouses. Elland, Sowerby, and other hamlets were as populous and rich as the township of H., but H. was the eccles. cap. of the dist., and its fairs and markets the most important. A member of Parliament was allotted to the par. in the seventeenth century. About the middle of the eighteenth century the local weavers began making worsteds, and within a short time the W. Riding became the centre of the Eng. cloth trade. In 1779 the Piece Hall (now used as a market) was opened, an immense cloth hall, marking the zenith of the trade. In the nineteenth century the leading H. manufacturers and public men were the Crossleys and Akroyd. In 1801 the pop. was 12,000; in 1831, 22,000; and in 1851, 34,000. This rapid growth led to overcrowding, and appalling sanitary conditions, and an inquiry was initiated by John Crossley the mayor, and Edward Akroyd, both of whom laid out

model housing estates, gave public parks, almshouses, and churches. By charter of March 22, 1848, H. became a municipal corporation, and under the Local Government Act, 1888, the bor. became a co. bor. H. was granted a separate court of quarter sessions in 1923. For the purposes of municipal elections the tn. is divided into fifteen wards, and the council consists of fifteen aldermen and forty-five councillors, governed by a mayor. There are six secondary schools, forty-three primary schools, and two special (day) schools, besides a municipal technical college, which provides courses of study for those engaged in the trades, industries, and professions in H., and the surrounding dists. Pop. (1945 estimate) 89,000.

See J. Watson, *History and Antiquities of the Parish of Halifax*, 1775; J. Crabtree, *Concise History of the Parish and Vicarage of Halifax*, 1836; T. W. Hanson, *Story of Old Halifax*, 1920; J. S. Fletcher, *Halifax*, 1923; and J. J. Mulroy (editor), *The Story of the Town that bred us* (centenary souvenir of Halifax), 1918.

Halifax, city and cap. of Nova Scotia, Canada, situated on the E. coast on a fortified eminence on Chebucto Bay. The harbour, which has splendid anchorage, is 8 m. long and 1 m. wide, and ice-free all the year round, being open to the Atlantic Ocean with its warm Gulf Stream. It has two entrances, which are formed by McNab's Is., situated at the mouth, and in the N. it is connected by a narrow channel with Bedford Basin, which is deep enough for the largest vessels. Until 1905 this was the sole point in Canada with a garrison of Brit. regular troops. It is the chief naval station of Brit. N. America, and is very strongly fortified. It is the Atlantic terminus of the Dominion Atlantic, Canadian National, and other railways. It was in response to the demands of the Act of Confederation of 1867 that the Intercontinental railway was built from H., reaching Rivière du Loup in 1876, and Quebec three years later. Most of its houses are built of wood and roofed with shingles. Notable are Admiralty House, the martello tower in Point Pleasant Park, and the Prov. House, home of the Nova Scotian legislature, which was built in the reign of George III. It is the seat of Dalhousie Univ. There are fascinating seascapes in the archives building of the univ. H. has a considerable share of the dried and canned export fish trade, and also handles the fruit from the Minas and Annapolis regions, apples and other temperate fruits, and dairy produce. There are also large lumber exports. There are foundries and machine shops, and a steel shipbuilding plant. On Dec. 6, 1917, occurred the H. explosion. Through carelessness navigation on both sides, a Fr. ship laden with nitro-glycerine and gasoline collided with a Norwegian ship carrying a relief cargo to Belgium; the result was that some 1800 persons were killed, 4000 persons injured, while more than 2 sq. m. of the city suffered total destruction. A great blizzard on the following day added to the tragedy. As the point of departure for hundreds of convoyed ships in

the war, H. had become the most important port on the Atlantic coast, and its people, conscious of the essential part they were playing, struggled to their feet with indomitable courage. Pop. 75,000. See T. H. Raddall, *Halifax: Warden of the North*, 1948.

Hall, Basil (1788-1844), Brit. naval officer, b. at Edinburgh. He entered the navy in 1802, and was present at the battle of Corunna in 1809, on board the *Endymion*. In 1816 he went to China with Lord Amherst's embassy, and described the incidents of the commission



Canadian Government

AN AERIAL VIEW OF HALIFAX, NOVA SCOTIA

Halifax Law, properly known as the **Gibbet Law**, was a curious custom enacted at an early period of the woollen manuf. to protect the trade. By this law the inhab. were empowered to execute any one taken within their liberty who had stolen property of the value of £1*s*d or above. The accused were tried by the truth-burgurers, and if found guilty were executed on a H. gibbet (an instrument similar to a guillotine) outside the tn. on a market-day. The last execution took place in 1650.

Halitherium, see DUGONG.

Halkirk, vil. of Caithness, Scotland, on the Thurso. Flagstones are quarried and exported, and there is a distillery. Pop. 2000.

Hall, Anna Maria (see Fielding) (1800-1881), Irish novelist, b. in Dublin, but left Ireland at an early age. Ireland, however, gave her the motive of sev. of her successful books, such as *Sketches of Irish Character* (1829); *Marian* (1840), and *The White Boy* (1845). Other works are *The Buccaneer* (1832) and *Midsomer Ere* (1848), a fairy tale; and many sketches in the *Art Journal*, of which her husband, Samuel Carter H., was editor. With him she collaborated in a work entitled *Ireland, its Scenery, Character, etc.* (1841). She was a very voluminous writer, and her descriptive talents and power of depicting character were considerable. She was prominent in charitable work, and assisted in the foundation of Brompton Consumption Hospital.

and the explorations in the E. seas, etc., in his *Account of a Voyage of Discovery to the West Coast of Corea and the Great Loo-Choo Islands* (1818). He also pub. *Extracts from a Journal written on the Coasts of Chili, Peru, and Mexico* (1823) and *Fragments of Voyages and Travels* (1832-34), which contains, besides the subject-matter of the title, some interesting accounts of the navy in the early part of the nineteenth century. In 1842 H.'s mind gave way, and he ended his days in Haslar Hospital.

Hall, Catharine, see HAYES.

Hall, Charles Francis (1821-71), Amer. Arctic explorer, b. at Rochester, New Hampshire. He was for some time a journalist, but offered his services to the Amer. Geographic Society in 1859 to go in search of Franklin. He sailed in 1860 on board a whaler, but was ice-bound and lived among the Eskimos for two years. He described his experiences in *Arctic Researches and Life among the Esquimaux* (1864). He made another expedition in 1864, and was more successful, finding out some information respecting Franklin's crew. In 1871 he went on a N. Polar expedition in the *Polaris* and reached 82° 11' N lat., until 1876 the highest point attained.

Hall, Charles Martin (1863-1914), Amer. inventor, b. at Thompson, Ohio, U.S.A. He graduated from Oberlin College in 1885. While there he became interested in the chemical problem of how to procure aluminium so that it would be cheap

and of wide use. Shortly after he graduated, and while still working in the Oberlin laboratory, he invented an electrolytic process which completely revolutionised commercial production of aluminium. He interested a great Pittsburgh concern in his discovery, and was made vice-president of the company. Aluminium soon became a metal universally in use, and H. made a big fortune. He bequeathed the greater portion of his millions to Amer. schools and colleges, Oberlin being the chief beneficiary.

Hall, Chester Moor (1703-71), Eng. optical inventor. b. in Essex; was a bencher of the Inner Temple in 1763. In 1733 he anticipated Dollond in the invention of the achromatic telescope.

Hall, Christopher Newman (1818-1902), Eng. Congregational minister. From 1842 to 1854 he was minister of Albion Chapel, Hull, and in 1854 minister of Surrey Chapel, Blackfriars Road, London, founded by Rowland Hill. He was a very popular preacher, and in 1876 a new church was opened for him in Westminster Bridge Road, where he remained till 1892.

Hall, Edward (c. 1499-1547), Eng. historian, b. in London; educated at Eton and Cambridge. In 1532 he was appointed common servant; from 1533 to 1540 he was reader at Gray's Inn and, in the latter year, judge of the sheriff's court. He became M.P. for Bridgnorth in 1542, and a commissioner to inquire into transgressions of the Six Articles (1541-4). But he is chiefly remembered for his *Union of the Noble and Illustre Familias of Lancastre and York* (1542), a glorification of the House of Tudor, and, especially, a justification of the actions of Henry VIII. Commonly called *Hall's Chronicle*, it was continued after the author's death by Richard Grafton, and was prohibited by Queen Mary. The first ed. is so rare that it may be doubted whether a complete copy has been extant for many years. The early part of the work is not of great independent value, but Shakespeare followed it closely in some of his earlier historical plays. For the reign of Henry VII. it is more important. H.'s basis is the hist. of Polydore Vergil entitled *Anglica Historia Libri III*, written in polished Lat., and valuable for Henry VII.'s reign though prejudiced towards Wolsey; while for the early years of Henry VIII. H. is an authority of considerable value on account of the information he gives on the social life and public opinion of the times. His descriptions of court festivities are striking and detailed and, in particular, he is instructive on the discontent awakened by Wolsey.

Hall, Sir Edward Marshall, see MARSHALL-HALL.

Hall, Joseph (1574-1656), Eng. bishop and satirist, b. at Ashby-de-la-Zouch, Leicestershire. He was educated at Emmanuel College, Cambridge, and while there wrote his *Virgineumarum* (1597), in which he claims to be the first Eng. satirist. For this he was attacked by Marston in 1598, and the works of both were burnt in 1599. In 1608 he

became chaplain to Prince Henry, in 1616 dean of Worcester, and in 1627 bishop of Exeter. His religious views corresponded with those of Charles I., but he was frequently blamed by Laud for his lenience to the Puritans. He defended the Eng. Church in *Ecclesiacy by Divine Right* (1640) and *An Humble Remonstrance to the High Court of Parliament* (1640), which latter produced a reply from the Puritan divines who wrote under the name of 'Smectymnus.' Thus began a long controversy in which Milton took part, attacking H. for his early satires. In 1641 he was trans. to Norwich, but at the end of the year was expelled from office and suffered imprisonment under the Long Parliament. When released he retired to Higham.

Hall, Marshall (1790-1857), Eng. physiologist, b. near Nottingham; graduated M.D. at Edinburgh in 1812, and visited foreign medical schools, 1814-15. He practised at Nottingham (1817-25), and in London (1826-33). His speciality was nervous diseases, and his main contributions to medical science are his discovery of reflex action, his rational treatment of epilepsy, and his introduction of methods of resuscitation in asphyxia and drowning. He pub. numerous medical and scientific works.

Hall, Oliver (b. 1869), Brit. artist. Studied art at S. Kensington and Lambeth art schools, and abroad. Became known first with his etchings, but later was chiefly a landscape painter. His 'Shap Moors,' bought by the Chantrey, trustee, is in the Tate Gallery, and his 'Angerton Moor' in the Budapest Gallery.

Hall, Owen (c. 1818-1907), pen-name of James Davis, dramatic author. He practised as a solicitor from 1874 to 1886. Became famous as a writer of musical comedy, his chief plays being *An Artist's Model* (1895); *A Gaiety Girl* (1896), *The Geisha* (1896); *Florodora* (1899), *A Greek Slave* (1901); *The Silver Slipper* (1901); *The Girl from Kay's* (1903); and *The Medal and the Maid*.

Hall, Robert (1764-1831), Eng. Baptist minister, b. at Aincry, Leicestershire; educated at Bristol and Aberdeen. In 1791 he succeeded Robert Robinson at the Baptist church in Cambridge. In 1807 he took charge of Harvey Lane church, Leicester, remaining there till 1826, when he returned to Bristol. His pub. sermons and other works rank high.

Hall, in architecture, term used in several senses: (1) A large room in a private or public building. Thus the *tepidarium* of the Rom. baths, and the interior of Egyptian temples are spoken of as Hs. In the Middle Ages the H. was the most important room in the residence of an Eng. nobleman. It may be said, in fact, that it was the only important room. Here all the inmates of the house, the lord, the ladies, the family, and the retainers, met for their meals, and here many of the latter slept. The pronouncement of the college Hs. at the univs. is a survival of this system, and their presence shows how the medieval H. retained its importance even after the multiplication of private rooms.

The medieval Hs. were simple in plan, consisting generally of a low, oblong apartment lighted from side windows. The public H. is a large room built for lectures, meetings, concerts, entertainments, or some such purposes. The name is often extended to the entire building, as especially in the tn. H. and the music H. (2) In Britain the term H. is applied to a large and important mansion, more especially in country dists. (3) In recent times it has also been given to the vestibule of a building when it is large enough to merit it. Generally the title is given if the room or passage into which the outer doors open is large enough to contain some furniture, but the term is often used very loosely.

Hallam, Arthur Henry (1811-33), Eng. poet, son of Henry H., historian, b. in London. He was educated at Eton and Trinity College, Cambridge. In 1829 he visited Italy with his parents, and on his return wrote some excellent It. sonnets. He entered the Inner Temple, 1832, but his health broke down, and whilst travelling on the Continent with his father, he d. in Vienna. He was an intimate friend of Tennyson, who commemorated his death in *In Memoriam*. His *Remains* were pub. in 1831.

Hallam, Henry (1777-1859), historian, b. at Windsor, son of a dean of Wells; educated at Eton and Oxford Univ. Was one of the first Eng. historians of importance to go to original documents for his material. The result of this careful research work is that his books, in spite of the investigations of his successors, still hold a place as standard authorities. He was not a brilliant writer, but he was impartial, and he was usually accurate. His first great work, pub. in 1818, was *A View of the State of Europe in the Middle Ages*, and this at once gave him a recognised position. It was followed nine years later by *The Constitutional History of England from the Accession of Henry VII. to the Death of George II.*, and his third important book appeared in 1837-39, the *Introduction to the Literature of Europe during the Fifteenth, Sixteenth, and Seventeenth Centuries*. All these have been trans. into the prin. languages of Europe, and have gone through numerous eds. In politics he was a Whig—like many of our historians of the eighteenth and nineteenth centuries—but he took no active part in party warfare.

Hallamshire, dist. of W. Riding, Yorkshire, England, which comprises the pars. of Sheffield and Ecclesfield. Its character is that of forest and moorland.

Halland, maritime dist. (län) of Götaland, Sweden. Said to have been acquired by the Dan. hero 'Dan' in the sixth century; ceded to Sweden at peace of Bromsebro, 1645. Area 1900 sq. m. Pop. 156,900.

Halle, Sir Charles (1819-95), Anglo-Ger. pianist and conductor, b. at Hagen in Westphalia. In 1836 he went to Paris, where he became friendly with Cherubini, Chopin, Liszt, de Musset, and George Sand, but was compelled to leave France in 1848 and came to London. Here he started pianoforte recitals, and it was

mainly due to him that Beethoven's sonatas became so well known in England. He frequently performed at concerts, and in 1853 was director of the Gentlemen's Concerts in Manchester. In 1857 he started the famous H. concerts. In 1888 he married Madame Norman-Neruda, the violinist, and toured with her in 1890 and 1891. H.'s orchestra (dating from 1857) was one of the best in England, and since H. has had as resident conductors Dr. Hans Richter, Sir Thomas Beecham, Sir Hamilton Harty, and Sir John Barbirolli.

Halle, Lady (Madame Wilma Maria Francisca Norman-Neruda) (1839-1911), violinist, b. in Moravia. She rapidly became famous, appearing in the London Philharmonic concerts, as well as in France and Russia, and in 1901 was appointed violinist to Queen Alexandra. In 1908 she played at the concert in London in memory of Joachim, with whom she had been very friendly. She was remarkable for technique, and was the first of the women violinists to compare with men in fullness of tone.

Halle, or Halle-an-der-Saale, tn. on the Saale, 18 m. E. by S. of Elsleben, connected by railway with Leipzig, Berlin, Frankfurt, Hanover, and Magdeburg, in Saxony, Germany. Its univ. was founded in 1694, and considerably augmented in 1817. Among the many buildings of interest may be mentioned the Gothic Marienkirche and the cathedral, now in the hands of the Calvinists (sixteenth century), the medieval tn. hall in the market square, where stands a bronze statue of Handel, who was b. in H., and the twelfth-century St. Moritzkirche. The chief industries are paraaffin and sugar refining, and the manuf. of machinery. The commercial prosperity depended largely on lignite beds in the vicinity. Close by are important salt works. In A.D. 806 H. was fortified by Charlemagne's son; in 965 it came under the control of the archbishop of Magdeburg; later became an influential Hanse tn. It is the bp. of Handel. In the allied operations of April 1944 the tier. salient which had extended westward from the line of the Mulde to the Leipzig-H. area was eliminated by April 20, and allied troops advanced eastward from the riv. Pop. 220,000.

Halle (Fr. Hal), Belgian city in the prov. of Brabant, situated on the R. Senne, 10 m. S.S.W. of Brussels. The chief manufs. are paper, sugar, and choco. It has a beautiful church dating from the fourteenth century. Pop. 17,100.

Halleck, Fitz-Greene (1790-1867), Amer. poet, b. at Guilford, Connecticut; became a clerk in New York, and in 1832 secretary to John Jacob Astor, who left him an annuity, upon which he retired in 1849. His first poems which attracted attention appeared in 1818-19 in the New York Evening Post, over the signature of 'Crunker & Co.', designating himself and J. R. Drake. His work includes *Fanny* (1820), a satire upon contemporary literature, fashions, and politics, and *Marco Bozzaris* (1825). His complete works appeared in 1868-69, ed. by J. G. Wilson. **Halleck, Henry Wager** (1815-73), Amer.

general, b. at Westerville, New York. From 1841 to 1866 he was employed on the defence works at New York, and in 1845 visited the prin. military estabs. in Europe. On his return he gave lectures on the science of war, publishing them under the title of *Elements of Military Art and Science*. He served in Mexico in 1846, and in 1849 helped to frame the state constitution of California. In 1862 he was made commander-in-chief of the Federal forces. He wrote *The Mining Laws of Spain and Mexico* (1859); and *International Law* (1861), etc.

Hallein, tn. of Salzburg, Austria, on R. Salzach, 8 m. S.E. of Salzburg. Has famous salt mines and brine baths. Pop. about 7000.

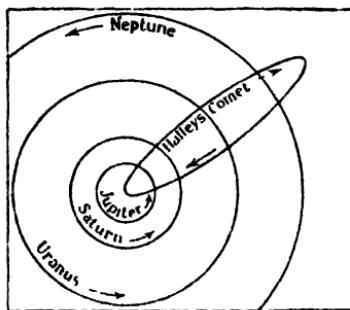
Hallelujah (Heb. 'Praise ye Jehovah'), term which is used as a doxology by both Jews and Christians, the custom dating from very early times. It is not used in the penitential seasons, being essentially a song of gladness, and in the time of St. Augustine was sung only from the feast of Easter to that of Pentecost. Later, however, it was omitted only in Advent and Lent, and on the vigils of the prin. festivals. The word was inserted in the Prayer Book after the first *Gloria Patri* in 1549; in 1552 trans. to 'Praise ye the Lord.'

Haller, Albrecht von (1703-77), Swiss poet, anatomist, and physiologist, b. at Bern. His poem *Die Alpen*, written in 1729, was the result of a journey through the Alps, and his other poems, lyrical and didactic, show him to be among the re-generators of Ger. poetry. He at first practised as a physician at Bern, gaining a name for his anatomical investigations, and in 1736 he was appointed prof. of medicine, etc., at the univ. of Göttingen, but resigned in 1753. His chief works (besides *Die Alpen*) are *De partibus corporis humani sensibilibus et irritabilibus* (1752); *Elementa physiologica corporis humani* (1757-66); and *Bibliotheca anatomica, chirurgica, medicina practica et botanica* (1771-72); also collected *Gedichte* (1732) and three philosophical romances, *Uson* (1771), *Alfred* (1773), and *Fabius und Calo* (1774). See studies by S. Lissauer, 1873, and S. d'Irsay, 1930.

Hallett, Holt S. (1845-1911), Eng. engineer and author, was employed (1860-1868) in building railways through Lancashire and Cheshire, and for the twelve years following (1868-80) was in the service of the public works dept. in India. The Indian and Burmese railway systems were constructed largely at his suggestion and in accordance with his practical recommendations. In 1883-84 he discovered the source of the Menam and made a preliminary survey for a branch line to Bangkok. H. wrote a great deal on social and economic questions of India.

Halley, Edmund (1656-1742), Eng. astronomer, was b. at Haggerston, London, and educated at St. Paul's School. In 1676 he went to St. Helena to observe the stars, earning for himself the title of the 'Southern Tycho.' In 1682 he began his study of the moon, and the important problem of gravity, which resulted in the pub. of Newton's *Principia* (1698-1700).

He studied the variation of the compass in the Atlantic, and pub. his results in a *General Chart of the Variation of the Compass* in 1701. In 1703 he was made Savilian prof. of geometry at Oxford, and in 1720 succeeded Flamsteed as astronomer-royal, and carried out a complete observation of the moon through a period of eighteen years. He is famous for having detected the 'long equality' of Jupiter and Saturn, for his method of determining the solar parallax by means of the transits of Venus, for his prediction of the return of



THE PATH OF HALLEY'S COMET

the comet of 1682, which occurred in 1759, and his discovery of the proper motions of the fixed stars, etc. A man of remarkable versatility, H. was also a poet, and is known to have written three poems, all in Lat.: the first in praise of Isaac Newton, prefixed to the *Principia*, which H. pub. at his own expense. His two other poems appeared in 1700, on his famous magnetic chart, one being in praise of Queen Anne, but now of little interest; the other lauding the unknown inventor of the compass. Another study of H. was that of geomagnetism, which in our time has been studied by Crichton Mitchell, and, prior to him, by Hellmann and Sylvanus Thompson; but the attraction of iron by the impact of loadstone was known to antiquity and is mentioned by Plato and many later writers. One remarkable gap in his geomagnetic work was his apparent total neglect of the magnetic dip, particularly in view of the importance given by Wm. Gilbert to the dip in his demonstration that the earth was a great magnet. For two centuries H. had no comparable successor in this field and the magnetic survey of the globe was not renewed with his zeal until in 1905 the Amer. Louis Bauer, with the support of Andrew Carnegie, resumed the task. See *Nature*, Aug. 30, 1943. His prin. astronomical and mathematical works are *Catalogus Stellarum Australium* (1679), the substance of which was incorporated in vol. iii. of Flamsteed's *Historia Coelestis* (1725); *Synopsis Astronomiae Cometicæ* (1705); *Astronomical Tables* (1752); and numerous miscellaneous papers in the *Philosophical Transactions*. Also may be added an ed. of the *Conics* of

Apollonius, with the treatise by Serenus, *De sectione cylindri et coni* (1710), and an ed. of the *Spherics* of Menelaus, pub. posthumously (1758).

Halley's Comet, name of the most celebrated of the periodic comets, taking its name from Edmund Halley (q.v.), who, in 1705, predicted that the comet of 1682 would return in 1758. This prediction proved true, and the comet has since returned in 1835 and 1910; its period being about seventy-five years, but this varies considerably owing to planetary perturbations. Halley thought that the comets of 1531 and 1607 were identical with his own, and it may be taken as practically certain that the comet of 1066, depicted on the Bayeux Tapestry, is H. C. It is also quite possible that it is the same as the comets mentioned in the Chinese records as having been seen in 87 B.C. and 240 B.C. At aphelion H. C. is thirty-five times more distant from the sun than the earth is at its mean distance.

Hallgrímsson, Jónas (1807-45), Icelandic poet and critic. After 1832 he lived mainly in Denmark, but was one of the chief agents in the reformation of Icelandic poetry. His chief poem, *Gunnarshólm*, has been tr. into Eng. by D. Leith (1897).

Halliburton, William Dobinson (1860-1931), Eng. physiologist, b. in London and well known to all medical students for his able editing of Kirke's *Physiology*, the stock text-book on the subject. He was educated at Univ. College School and at Univ. College Hospital, serving as house physician at the latter place. He was assistant prof. of pathology at Univ. College (1883-89) and, later, prof. of physiology at King's College. H. resigned the latter post in 1928, when he was made emeritus prof. there.

He was one of those students of physiology who contributed to raising the subject, in England, from a theoretical into an experimental science, deriving much inspiration from Wm. Sharpey. His own side of the work was chiefly directed to the chemical aspect of nervous activity, the biochemistry of muscles and nerves, and the relation between chemical physiology and pathology. President of the physiological section of the Brit. Association in 1902 and of the Brit. Medical Association in 1900 and 1908.

Halling, par. and vil. in Kent, England, situated on the Medway, 3½ m. S.S.W. of Rochester. The chief industry is connected with Portland cement. Pop. 2500.

Halliwell - Phillips, James Orchard (1820-89), Eng. biographer, was all his life a collector of books and MSS. It is as a Shakespearian student, however, that he became eminent. His biography of Shakespeare appeared in 1848. As the result of further investigation he pub. his *New Note about Shakespeare and Stratford-on-Avon* (1850). In 1863 he supplemented his previous works with his *Illustrations of the Life of Shakespeare*. He also pub. a *Dictionary of Archaic and Provincial Words* (1846) (known as Halliwell's).

See G. R. Wright, *A Brief Memoir of the Late J. O. Halliwell-Phillipps*, 1889, and an obituary in the *Athenaeum*, 1889.

Hall-marks, or Plate-marks, set of marks impressed upon gold and silver wares at the Goldsmiths' Hall, London, or one of the five other authorised assay offices, to attest the genuineness of the metal and the date of its testing. Hall-marking was first introduced in 1300 when, under a statute of Edward I., it was necessary to impress upon each piece of plate assayed the effigy of a leopard's head (*the king's mark*).

The series now consists usually of the following marks: (1) the *standard mark*, indicating the standard of the metal; (2) the *tou n mark*, indicating the tñ. where the assaying has been done, (3) the *date mark*; letter changed annually and showing the year in which the article has been marked at the assay office, the type of letter and the shape of the shield being changed at the end of each cycle of twenty, twenty-five, or twenty-six years; (4) the *maker's mark*, impressed by the maker and consisting of the initial letters of his Christian names and surname.

The authorised standards of fineness are: for gold, 22, 18, 14, and 9 carats of fine gold in every 24 carats of metal, of which standards the decimal equivalents are: .9166, .750, .585, and .375 respectively; for silver, 11 oz. 10 dwt. and 11 oz. 2 dwt. of the silver in every 12 oz. troy, of which standards the decimal equivalents are .9584 and .925 respectively.

In general the law requires that any gold or silver ware made in the United Kingdom or imported or offered for sale there shall be hall-marked before being sold or offered for sale. The list of gold wares exempted from compulsory hall-marking is contained in the Plate (Offences) Act, 1738. The Silver Plate Act, 1790, declares that certain silver wares are exempted. Rings were exempted by the Act of 1738, but now gold wedding rings must be assayed and marked as gold plate. All jeweller's work in which jewels or stones are set is exempt (Act of 1738). Gold or silver plate manuf. abroad over 100 years before being imported or being sold in the United Kingdom is exempted from assay and marking (Hall-marking or Foreign Plate Act, 1939). Articles of foreign plate which may be described as hand-chased, inlaid, bronzed, or thigree work of oriental pattern are exempt from assay and marking in the United Kingdom (Revenue Act, 1884).

To forge a hall-mark or to transpose a hall-mark from one ware to another is a felony punishable by imprisonment. A person who without lawful excuse possesses or offers for sale a ware bearing a forged or transposed hall-mark is liable to a penalty varying from £10 to £50. See J. P. de Casro, *Hall-marking Gold and Silver Ware: Law and Practice*, 1933.

Hall of Fame, building in the grounds of New York Univ., opened in 1900 to commemorate great achievements of Amer.

It has a colonnade containing 150 panels for bronze tablets bearing name of person, dates of birth and death, and particulars of works. The names were submitted to the univ. senate, who submitted them to 100 selected persons, it being the intention at first to select fifty names and five every five years so that all the panels would be filled by the year 2000.

Halloween, Hallowe'en, or All Hallow-e'en, name given to Oct. 31, the eve of All Saints or Hallow mas. It was generally believed that it was the time when supernatural influences prevailed, indeed this day is still called the Vigil of Saman (Saman being the lord of death) in some parts of Ireland. In Scotland and England, H. was long observed by fireside revelries which were chiefly concerned with divination of the future.

Hallstatt, see under IRON AGE.

Hall-Stevenson, John (1718-85), Eng. author; was a friend of Laurence Sterne, and the Eugenius in the latter's *Tristram*. He wrote an imitation of *Tristram Shandy* and a continuation of *A Sentimental Journey*. His prin. book is *Crazy Tales* (1762), a collection of clever verses, disfigured, as all his writings are, by coarseness of expression and thought. He entertained at his seat, Skelton Castle, a club called The Demoniacs, of which Sterne was a member. There is an account of him in L. Melville's *Life and Letters of Sterne*, 1911.

Hallström, Per (b. 1866), Swedish writer, a native of Stockholm. For some years he worked as a civil servant in the post office, but he definitely resigned his position in 1897. In spite of his humorous vein, which reveals to him the comic side of life, H. ranks in literature with the idealists. It is the purity and charm of his prose which his countrymen especially single out for praise. Among his works are *Vilma Fjular* (1894); *Purpur* (1895); *Vären* (1898); *Thanatos* (1900), *Duda Fullé* (1902); *Gustaf Sparrefoots roman* (1903); trans. of Shakespeare (1922-31).

Hallucination (from Lat. *alucinari*, to wander in mind; Gk. *ἀληθεία*, wandering), perception of an object which does not exist, while illusion consists in wrong interpretation of the sen-sory object. H. may or may not involve delusion, i.e. belief in the reality of the object falsely perceived. Sane people can recognise almost at once that their brains are playing them tricks, whereas the insane or those under the influence of hypnotism are not able to do so. Hs. of all the senses occur, but those connected with sight and hearing are the most common. It generally depends upon the condition of the brain whether a person suffers from H. or not; if he is in a semi-conscious state, or insane, or under the influence of drugs, or hypnotism, his brain cannot work properly, and the result is he thinks he actually sees something of which he is thinking, i.e. he suffers from H.

Halluin, tn. of France, in the dept. of Nord, and the arron. of Lille, on the Lys, 11 m. N.N.E. of Lille. It is an important industrial tn., with manufs. of cottons and linens, oil, bricks, chairs, and rubber goods. Pop. 12,000.

Halmahera, see JILOLO.

Halmstad, seaport at the mouth of the Nissa, on the E. shore of the Cattegat, 70 m. N.W. of Christianstad, in the dist. (lan) of Halland, Sweden. The chief exports are granite, timber, butter, and hats, whilst in the tn. are manufactories of beer, wood-pulp, jute, and paper. Both the salmon fisheries and potato crops are profitable. Pop. 31,300.

Halmyros, or Kirtsinion, tn., 18 m. S.W. by W. of Volos, in the prov. of Larissa, Greece. Pop. 7000.

Halo, word applied to any luminous ring, such as that sometimes seen around the sun and moon; probably derived from *ἅλως*, a threshing floor, on account of the circular path traced out by the oxen threshing the corn. In physical science, Hs. are coloured circles which appear around the sun and less frequently about the moon. They are formed by refraction of light by ice crystals floating in the atmosphere. It is necessary to distinguish between Hs. and corona. Hs. are at definite distances (22° and 46°) from the sun, and are coloured red on the inside, being due to refraction; corona surround the sun at variable distances, and are coloured red on the outside, being due to diffraction. Hs. are very common in N. regions and are not rare in our climate. The H. which is most commonly seen has an angular radius of 22° . Mariotte explained the phenomenon by the existence of ice crystals in the atmosphere. Crystals of ice occur in numerous forms, but one crystalline form occurs more frequently than all others; this is the form of a hexagonal prism which may be elongated like a needle or very flat like a thin flake. Three different refracting angles are possible in a hexagonal prism. Two adjacent faces are inclined at 120° , alternate faces at 60° , and the base of the prism forms an angle of 90° with the sides. To explain the H. of 22° , suppose the air contains ice crystals distributed in all directions in space; there must occur prisms whose edges will be perpendicular to the plane drawn through the luminary and the observer's eye. The minimum deviation for a ray of light passing through a prism of ice of refracting angle 60° is exactly 22° . Therefore, since the changes of deviation are slowest near a minimum or maximum, a maximum of light will be seen in all directions making an angle of 22° with the line adjoining the eye and the luminary. Also, since red rays are deviated less than blue rays, the H. will be coloured red on the inside and violet on the outside. Cavendish attributed the H. of 46° to the refraction of light across faces inclined to each other at 90° . Calculation shows that for such a refraction through an ice prism the minimum deviation is 46° . Thus the formation of the H. and the order of the colours are explained just as before. The impurity of the colours in Hs. is due to two causes: first, the superposition of the spectra produced by light coming from different points on the luminary; secondly, oblique refraction. As a rule, only the red is at all pure, a mere trace of blue or green is

soon, the external portion of each H. being nearly white.

Halo, or **Nimbus**, disk or glory encircling the head of saints and holy persons in sacred art, used in the W. as a symbol of sanctity from about the fifth century. It had a pagan origin, being known to Hindu, oriental, and classical art. In the E. it was regarded as the 'attribute of power,' figuring in Byzantine art in representations of Sataan and other great powers of evil. Many of the Roman emperors are represented with radiating diadems or Hs. The usual form of the nimbus is circular; sometimes it is formed by concentric circles, or indicated by a straight line or by rays diverging from the head. A triangular or cruciform H.— or , the Constantinian monogram or labarum—marked one of the three persons of the Trinity. A square nimbus denoted that the person represented was still living. The nimbus was usually of gold, but sometimes of other colours. After the Renaissance it became lighter, almost melting away into the picture. An illumination surrounding the whole figure was called an aureole.

Halogens, or salt-producers (Gk. *ἀλς*, salt), group of four non-metallic elements, viz. fluorine, chlorine, bromine, and iodine (q.v.), which have properties similar to one another but graduating in the order given above. The halides or haloids are the metallic salts of the halogen acids, and may be formed in most cases by the direct combination of the metal and the halogen.

Halophytes, see **SALINE PLANTS**.

Hals, Dirk (c. 1580-1656). Dutch genre painter, brother of Frans H. the Elder, pupil of A. Bloemaert. Examples of his work are at Amsterdam and Copenhagen. His pictures can be traced from 1624 to 1653, usually representing cavaliers, women, and young people drinking, dancing, listening to music, or talking, as in 'A Party of Ladies and Gentlemen,' 'Three Musicians,' and 'Two Persons Dancing.' His pictures have recently been highly appreciated.

Hals, Frans, the Elder (c. 1580-1666). Flemish portrait and genre painter, b. at Antwerp. In 1616 he settled at Haarlem, where his brother Dirck was b. and d. He was perhaps a fellow pupil of Rubens under van Noort before 1600, and on his removal to Haarlem entered the atelier of van Mander; studied under van Mander the elder. Reputed second only to Van Dyck as a portrait painter, H. was the pioneer in the Dutch school of free, broad brushwork, noted for his masterly juxtaposition of flesh-tints and portrayal of laughter and merriment (see his 'Laughing Cavalier' in the Wallace Collection, London). He worked largely in Haarlem and Delft; the Haarlem Museum, which was once an almshouse of which the painter and his wife were inmates, contains the great groups by H. and is mainly a F. H. memorial (though there are excellent pictures by other painters whom the town fostered). Fine works are 'St. George's Guild Banquet' ('St. Joris' Doelen', 1616 and 1639), at Haarlem; 'F. Hals and

Lysbeth Reyniers' (1624); 'Hille Bobbe' in the Berlin collection (1650); 'Regents of the Old Men's Almshouse' (1664). The Louvre has his 'Bohémien'; Antwerp Museum of Fine Arts his 'Dutch Nobleman'; Munich, 'Fish Girl' and 'William Croes'; the Ryks (Amsterdam), 'The



'THE LAUGHING CAVALIER'

From Frans Hals's picture.

Painter and his Wife, in a Garden'; Brussels (Palais des Beaux-Arts), 'Willem van Heythuysen'; and there are some portraits in the National Gallery, London. Several of his sons were minor artists. See W. von Bode, *Franz Hals und seine Schule*, 1871; D. Knackfuss, *Franz Hals*, 1896; and W. von Bode and M. Binder, *Franz Hals, sein Leben und seine Schule*, 1914.

Halsbury, Hardinge Stanley Giffard, first Earl of (1823-1921), Eng. lawyer and statesman; b. Sept. 3, in London; son of Dr. Stanley Lee Giffard, a native of Dublin, but of Devon descent, who for a quarter of a century ed. the London *Standard*. H. was educated at Oxford, graduating 1845. He became a barrister of the Inner Temple, 1850; Q.C., 1865; solicitor-general under Disraeli, 1875-80; M.P. (Conservative) for Lancaster, 1877-85. H. was lord high chancellor of Great Britain four times between 1885 and 1905, first appointed under Lord Salisbury's administration, 1885-86; again in his second govt., 1886-92; again in 1895-1900; and also in Balfour's first administration, 1902-5. He was engaged in the famous Overend and Gurney and Tiverton cases. He was created Baron H. in 1885; earl of H. and Viscount Tiverton, 1898. H. was high steward of Oxford Univ. from 1896. He was president of the Royal Society of Literature, and senior grand warden of Eng. Freemasons. He was foremost among the 'Diedhards' who opposed the passing of the (1911) Parliament Bill through the House of Lords.

He ed. *The Laws of England*, a compendious statement in alphabetical order of subjects, 31 vols., 1907-17. As late as 1916 he sat as a judge in the House of Lords. *D.* in London, Dec. 11. See J. B. Atlay, *Victorian Chancellors*, II, 1908.

Helsingborg, see HELSINGBORG.

Halstead, or Halsted, m.rkt. tn. of Essex on the R. Colne, 14 m. N.W. of Colchester. The much restored par. church stands in the upper part of the tn. and contains some fine monuments of the Bourchier family in the S. aisle. The Courtauld Homes of Rest were built in 1924. On the N.W. side of the High Street is Chantry House, incorporating some remains of a college said to have been founded in 1411 by Lord Bourchier. Messrs. Courtaulds Ltd. have a large textile factory here. In the neighbourhood is the anct. tn. of Castle Hedingham, with one of the finest Norman keeps in England and a large twelfth-century church. Pop. 6800.

Haltwhistle, m.rkt. tn. and par. of Northumberland, England, 14 m. from Hexham, on the N.E. region railway. It lies in the valley of S. Tyne, with Hadrian's Roman wall 1½ m. S., and Featherstonehaugh Castle near bv. It contains two border towers and other antiquities. Coal and clay industries are carried on, and coarse baize is manufactured. Pop. 9600.

Halver, tn. of Westphalia, Germany, 15 m. from Barmen; has iron manufs. Pop. 7900.

Halyburton, Thomas (1674-1712), Scottish divine, b. at Duppilin, near Perth. His father, one of the ejected ministers, having d. in 1682, his mother in 1685 took him to Rotterdam, where he attended the school instituted by Erasmus. On his return to Scotland in 1687 he completed his education at Perth and Edinburgh, and in 1692 entered St. Andrews Univ., graduating in 1696. He became minister of Ceres, Fifeshire (c. 1700), for eleven years, and prof. of divinity at St. Andrews (1710). His works, once very popular in Scotland, include *Natural Religion Insufficient, and Hercules Necessary, to Man's Happiness* (1714); *The Great Concerns of Salvation* (1721); and *Ten Sermons...* (1722), which were mostly written against the deists. See his *Memoirs*, written by himself and frequently reprinted, 1714; *Works* (pub. by Dr. Burns), 1835; J. Leland, *new of Deistical Writers*, 1761; and A. Chalmers, *Biographical Dictionary*, 1812.

Ham, according to Gen. x., one of the three sons of Noah, and ancestor of the Ethiopians, Egyptians, Babylonians, etc. The narrative in Gen. shows traces of much alteration, and it is clear that in v. 22 (chap. ix.) the present verse originally had Canaan instead of H., Noah's three sons thus being Shem, Japheth, and Canaan. At this period the div. between the three was considered as referring to Palestinian groups, but it was later extended to the surrounding nations. The name H. is usually derived either from an anct. name for Egypt signifying 'black,' or from the name of an early Babylonian king.

Ham, com. of Somme dept., France, on the Oise-Somme canal, Péronne arron., 12 m. from St. Quentin. Its famous and now ruined old fortress has often served as a State prison. Among its most celebrated prisoners were Charles X.'s ministers (1830), and Prince Louis Napoleon (1840-1846). During the First World War H. suffered considerably, especially in the spring of 1917. Pop. 2700.

Ham (connected with Lat. *camur*, crooked), properly the hind part or anglo of the knee, usually applied to the cured thigh of hogs or sometimes of sheep or oxen. H. curing and bacon curing are important industries, performed in various ways according to the country and dist. Salting and smoking are essential operations. The meat is rubbed with salt, and later with a mixture of salt, salt-petre, and sugar. Smoking is carried on in smoking-houses, the meat being hung high, and the fire kept smouldering with wood for five or six weeks. Wet salting requires three weeks, dry salting about four weeks. Beef and mutton H.s. are cured largely in N. England, and Dumfriesshire, Scotland; pork-curing thrives at Chicago.

Ham, East, see EAST HAM.

Ham, West, see WEST HAM.

Hamadan, tn. of Persia in Irak Ajemi, 163 m. S.W. of Teheran, at the base of Mt. Elvend. The anct. tn. was Ecbatana (a.v.). H. has an elevation of about 6000 ft. It is a trading place of considerable importance, being one of the routes from Bagdad to Teheran and Isfahan. It has extensive bazaars and caravanserais. The chief objects of interest are the tomb of Avicenna, near the great mosque, resorted to by pilgrims, and the reputed tomb of Esther and Mordecai, a structure of black wood. The prnl. industries are carpet-weaving and tanning. During the First World War the tn. and dist. were occupied by the Turks. Roads were greatly improved during that period. Pop. 103,000.

Hamadryad, King Cobra, or Giant Cobra, one of the oriental cobras of a large and poisonous variety, found from S. India to China and the Philippines, sometimes reaching a length of 13 ft., and one of the longest and most venomous of snakes. It is of a yellow colour, with black crossbands; of a fierce disposition, and feeds wholly on other snakes.

Hamadryads, eight daughters of Hamadryas, in Gk. mythology. They were nymphs attached to particular trees, from which they received their names, and with which they were supposed to come into existence and die. They did not possess immortality, thus differing from other nymphs. They were also known as dryads and oreads and lived in forests from which they never emerged.

Hamah, see HAMATH.

Hamamatsu, coast tn. of Hondo, Japan, 120 m. W.S.W. of Yokohama. Pop. 133,000.

Haman ('Full of Grace'), see ESTHER.

Hamann, Johann Georg (1730-88), Ger. author, sometimes called the Magician of the N. from the originality of his thought, b. at Konigsberg in K. Prussia. He lived

somewhat chequered life, trying various callings, but finally devoted himself to the study of ant. languages and oriental literature. He knew many eminent authors and largely influenced Goethe and Herder, though his own writings were little esteemed by his contemporaries. H. wrote *Sokratische Denkweckungen* (1760) and *Kreuzzüge des Philologen* (1782). His complete works were pub. by F. Roth, and C. Gildemeister wrote his biography. See J. Claassen, *Hannans Leben und Werke* (1885).

Hamar, or **Storehammer**, tn. in Norway, 59 m. from Oslo, on Lake Mjøsen. It is the seat of a bishopric, and has breweries and metal and iron foundries. It is an important railway junction. Pop. 6000.

Hamasah, or **Hamāṣeh** (Arabic *hamāṣah*, bravery, from *hamasa*, to be firm), famous collection of Arabic poetry compiled by Abu Tamimam, and divided into ten books (c. 807-846). The first (dealing with the heroes of pre-Islamic times) is the longest book, and the remaining nine deal with various subjects. The collection is of great historical value, and is taken from extempore works chiefly. There are three eds. of the Arabic, viz. Freytag's, Bulak's, and the Calcutt. ed., 1856. See Sir C. J. Lyall, *Ancient Arabic Poetry*, 1885.

Hamath ('fortress,' or 'enclosed place'), or **Hamah**, city situated on the banks of the Orontes, chief city of the Hittites, and cap. of the surrounding ter. In sev. places of the O.T. (e.g. Num. xxxiv. 8; Judges iii. 3) it is spoken of as the N. boundary of the kingdom of Israel. It later came under the suzerainty of Solomon, on whose death it became independent. It then finally came under the dominion of Assyria, and was entirely destroyed by Sargon. It was known to the Gks. and Romans as Epiphaneia.

Hambach, com. of the Rhine Palatinate in Germany, formerly of Bavaria, 2 m. S. of Neustadt. The 'Hambacher Fest,' a great Ger. Liberal meeting, was held here in 1832, proclaiming the 'sovereignty of the people,' as the foundation of organised government. Pop. 3000.

Hambato, or **Ambato** (**Hambald**), tn. of Ecuador, cap. of Tunguragua prov., about 78 m. S. of Quito, between Chimborazo and Cotopaxi. Destroyed in 1698 by an eruption of Cotopaxi, and by an earthquake in 1796, it became very flourishing later on. It trades in grain, cochinchin, and sugar, and has shoe manufactories. It is also a vine and fruit growing dist., the climate being temperate. It is connected with Guayaquil and Quito by rail. Pop. 20,000.

Hamborn, rural com. of the Rhineland, Germany, in the dist. of Dusseldorf. Noted for coal and iron industries. Pop. 103,000.

Hamburg, city of Germany, chief tn. of H. state, situated on the N. bank of the Elbe. It is the largest seaport on the Continent, and the third largest in the world. The greater part of the harbour, before the Second World War, was a free port, and, with the two now docks completed in 1904, the total water area amounted to 1250 ac. It was one of the chief continental ports for the embarking

of emigrants from Europe. Prior to the war the city consisted of two radically different parts, the central part, reconstructed since the fire of 1842; and the ant. ramparts, separating the old city from the adjacent suburbs. The beauty of the city is much enhanced by the large sheets of water formed by the Alster. The canals in the city are spanned by over sixty bridges, and there are numbers of steam ferries. There were many fine public buildings; notably the exchange, with a commercial library of over 110,000 vols.; the Rathaus, completed in 1897; the Deutsches Schauspielhaus, completed in 1900; the marine office (Seewarte), and numerous museums of arts, crafts, botany, natural hist., etc. H. was noted also for fine churches, e.g. St. Michael, St. Peter, St. Nicholas, and St. Catherine, dating from the fifteenth century. But the churches of St. Catherine and St. Jacob were destroyed in the Second World War; that of St. Michael suffered a direct hit on the E. end. The Rathaus survived, and the museums were but little damaged, except those of hist. and geology. The univ., although damaged, admits of repair. Two-thirds of the books in the library were lost.

The streets of H. are well paved and kept very clean, the prin. thoroughfare being the Jungfernstieg. The fever hospital of H., opened in 1894, was considered one of the best in the world. There were many large and excellent private schools, as well as over 200 public schools, in addition to gymnasiums, a school of art, and a conservatoire. The univ. of H., formed in 1919, consists of the faculties of law, medicine, natural science, and philosophy, and had 5000 students in 1948. In 1888 H. became a member of the Ger. Customs Union, which did much to stimulate its trade. Among its chief industries are cigar making, spirit and sugar refining, machine and shipbuilding, brewing, flour-milling, and the manuf. of furniture, musical instruments, mechanical and optical instruments, leather, ivory, etc. It was, prior to the Second World War, also one of the largest coffee marts in the world. Prior to the Nazi reg., no the city-state had a democratic constitution, and was administered by an executive Senate elected by the House of Representatives; the legislative power was confined to the House of Burgesses. H. seems to have been founded early in the ninth century by Charlemagne, who built (811) a citadel and church as a defence against the Slavs. In 831 an episcopal see was estab. by Louis the Pious (son of Charlemagne) and in 834 the bishopric was raised to the rank of an archbishopric. Later, however, Ansgarius, first occupant of the see, who founded a monastery and school, saw his labour nullified by Norman pirates, who reduced the see to ashes. A large part of the original ter. of the archbishopric fell away from its allegiance and in 817 it was decided at a synod at Mainz that H. should be attached to the bishopric of Bremen, and the seat of the archbishopric be in the latter city. All through

the tenth century H suffered from the incursions of the Danes and Slavs; but despite this, Archbishop Alebrand built a cathedral in 1037 and Archbishop Adalbert a castle soon afterwards. During the twelfth century it became an important commercial centre for N Europe, and in 1189 was granted important privileges by Frederick Barbarossa, and by treaties with Lübeck and Bremen in 1241 and 1249 rc

its tourist and emigrant traffic, declined considerably after the First World War. In accordance with the treaty of Versailles the commercial fleet of H. was left with only small vessels of 82,000 aggregate tonnage. Subsequently, however, trade gradually resumed its previous level, only to be reduced to vanishing point in the Second World War.

The great port especially the harbour



*Staatsliche Tiefwasserstelle Hamburg,
HAMBURG THE JUNGFIRNSTEIG AND THE ALSTER*

spectively, formed the Hanseatic League. It was formally acknowledged as an imperial city in 1618. Owing to the immunity of its position, its prosperity increased during the Thirty Years' war and in the eighteenth century commercial relations with N America were developed owing to the Amer and B. revolutions and the wars between England and France. In 1815, it became an independent state of the German Federation, and its trade and importance thereafter greatly increased. It united with the Ger Empire as a free city state in 1871. H occupies a distinguished place in the list of Ger literature and the drama. It was the home of Heine, Lessing, Klopstock, Schroder. Until recent years H was practically the biggest commercial city of Europe, and next to London had the largest money exchange transaction on that continent, the bank of H. having been founded in 1619. As a commercial centre, its only rivals were London, Liverpool, Antwerp, and New York. But its general trade, as well as

quarters, was much damaged in the Second World War prior to its surrender and occupation by the 7th Armoured Div. on May 3 1945. The docks and industrial buildings were repeatedly bombed by the R.A.F. in 1940-41, many of the dock cranes being put out of action. But these raids were innocuous as compared with the tremendous attacks of July Aug 1943. Thus there were seven attacks between July 21 and 28, on which latter date 2300 tons of bombs were dropped, and great fires raged in the port all that week. One of the heaviest raids was that of July 21, as also was that of the following day, which was unheeded, as all the sirens had been destroyed. Evacuation of H was ordered, and the inhab strained eastwards, causing congestion on the roads as the people of Holland, Belgium, and France did in the Ger invasion of 1940. In subsequent raids, in Aug. 1943, the anti-aircraft guns were soon silenced, and the city hammered at will in attacks by successive fleets of 1000 and 1200 planes.

In all about 9 sq. m. of H. were devastated, and more than 75 per cent of the city's 15 sq. m. of fully built-up areas were wiped out (for the loss of eighty-seven bombers). This damage was wrought by some 9000 tons of bombs. Much ruin was caused by 'block-busters' (q.v.), though a great deal of damage was also due to fires from incendiary bombs. An official summary of the damage showed that eight shipbuilding yards were completely destroyed or very seriously damaged, together with three oil works, six non-ferrous metal works, twenty armament and steel works, eleven chemical works, eight textile factories, twenty-one food-stuff plants, and thirty-one miscellaneous factories. Some sixteen public utility works were either destroyed or irreparably damaged, as also were fourteen administrative buildings, sixteen transportation units, and more than 400 warehouses. The damage extended throughout the dock area and widely to the E. and W. Support for the argument that air bombing, if conducted on a sufficiently large scale, could win the war was provided by this detailed survey of the damage done in the battle of H. The capacity of the port in 1948 (in terms of cargo) was not more than 25 per cent of its peacetime standard; but any increase over that proportion depended on the Allies' decision on the amount of production to be allowed Germany. There lay sunk in the riv. after the war fifty-five ships, 2000 barges, and sixteen floating docks. Pop. (1946) 1,424,100. See W. Melhop, *Historische Topographie von Hamburg*, 1923, and H. Heineke, *Hamburgs Geschichte*, 1933.

Hamburg-American Line, originally called Hamburg-Amerikanische Packetfahrt-Aktiengesellschaft, or H.A.P.A.G., was founded on May 27, 1847. The *Borussia* (1856) was the first steamship to carry C.S.A. mails; and the *Furst Bismarck* was the first to accomplish its journey from Southampton in less than six and a half days. Under Albert Ballin the H.-A. L. made such progress that before the First World War Hapag ships were the fastest transatlantic liners. Ballin then built some of the world's largest vessels, the mammoth liners *Imperator* (1912), later known as the *Berengaria* (q.v.), of the Cunard line; the *Vaterland* (1914), later the *Lorraine* of the U.S. Shipping Board, and the *Bismarck* (1921), later the *Majestic* (q.v.) of the White Star Line. In 1914 the Hapag fleet consisted of 439 ships aggregating 1,360,000 gross registered tons; and no fewer than seventy-five regular lines were operated to overseas destinations, serving 400 ports in all parts of the world. Ballin d. on Nov. 9, 1918, and thus never knew that by the Versailles treaty the Hapag surrendered entirely to the Entente except for a few small units. In 1920 the company re-established its New York service, in agreement with the Harriman concern (United Amer. Lines), with the *Cleveland* (1908), *Hesolute* and *Reliance* (both 1920) of the United Amer. Lines, and the *Albert Ballin* and *Deutschland* (both 1923), Ham-

burg (1926), and *New York* (1927) of the Hapag. Later the Hapag amalgamated with the Ger.-Australian and Kosmos lines, and in 1930 concluded an agreement for a community of interests and operations with the N. Ger. Lloyd. Before the outbreak of the Second World War the Hapag had some 200 vessels with a gross tonnage exceeding that of 1914. It had passenger and cargo services to N. and S. America, the Dutch Indies, Far E., Australia, Africa, and E. Mediterranean, as well as health and pleasure cruises.

'Hamburger Nachrichten, Die,' estab. in 1792; a moderate Liberal, and at one time a very influential, paper. Prince Bismarck attacked through its columns the gov. of William II.

Hamburg-South American Line, The, was estab. in 1871, and at the outbreak of the First World War possessed fifty-six steamers, with a total tonnage of 251,000. After the war its services were suspended by losses of some vessels, and by delivery of the remainder to the Reparations Commission. Reconstruction began in 1921, and by 1927 the company had the fastest steamers plying between Europe and S. America—the *Cap Arcona* (1927), 20 knots, of 27,560 tons gross register, and the *Cap Polonio* (1911), 18 knots (one of the largest steamers of war fitted for liquid fuel) of 20,500 tons gross register. The company also built a series of motor-ships of 14,000 tons gross register, with a service speed of 14 knots, for carrying third-class passenger holiday cruises.

Hamden, tn., Newhaven co., Connecticut, U.S.A., 6 m. N.N.E. of Newhaven. It manufs. augers and garden implements. Pop. about 2,300.

Hame, dept. of Finland, the surface of which is largely occupied by lakes. Area 7100 sq. m. Pop. (1930) 390,000. Cap. Tavastehus. Tammerfors (Tampere) is the largest tn. (71,700).

Hamein, tn. of Hanover, Germany, on the Weser, 33 m. S.W. of Hanover. There are many auct. houses here, but the only public buildings of any interest are the minister church, restored in 1872 and a tn. house. It is famed as being the scene of the legend of the Pied Piper. In the Second World War the 19th (Amer.) Corps of the First Army estab. a bridgehead over the Weser at H. on April 6, 1945. Pop. 27,900.

Hamerling, Robert (1830-89), Austrian poet, b. in humble circumstances. Educated at the univ. of Vienna. In 1860 he pub. his first vol. of lyrics, *Sinnen und Minnen*, which was followed by *Amor und Psyche* (1882); and *Blatter im Winde* (1887). *Ahusrer in Rom* (1866) and *Der König von Sion* (1869), two powerful satiric epics, are his masterpieces. See his life by M. M. Rabenlechner (1896 and 1901), and A. Polzer (1890).

Hamerton, Philip Gilbert (1834-94), Eng. art critic, b. at Lancashire in Lancashire. He worked at landscape painting in Scotland, but in 1858 settled in France, and devoted his life to art criticism. His pubs. include *A Painter's Camp in the Highlands* (1863); *Etching and Etchers* (1866); *Contemporary French*

Painters (1868); *Painting in France after the Decline of Classicism* (1869); *The Graphic Arts* (1882); and *Landscape* (1885). Of his more general literary works the chief are *The Intellectual Life* (1873), and *Human Intercourse* (1884). His autobiography and a memoir by his wife were pub. in 1896.

Hamesucken, in Scots law, means the felonious seeking and invasion of a person in his dwelling-house. It consists essentially in the co-existence of entry with intent to commit an assault and actual personal violence. The entry may be either by terrifying those within or by artifice, or by secretly entering and lying in wait for an opportunity of assault. Formerly H. was punishable with death, but since the Criminal Procedure Act, 1887, penal servitudo or other imprisonment has been substituted.

Hamheung, walled tn. of Korea, situated near the E. coast of the peninsula in lat. 39° 56' N. Pop. 78,000

Ham House, near Petersham, Surrey, the former seventeenth-century home of the duke of Lauderdale, notable for its historic contents, and now attached to the Victoria and Albert Museum. The house was built in 1610 by Sir Thomas Vavasour, a successful lawyer, and the H-shaped Jacobean plan survives in all essentials. Under Charles I. H. H. was bought by Wm. Murray, later earl of Dysart. His daughter, Elizabeth, countess of Dysart in her own right and wife of Sir Lionel Tollemache, made considerable alterations, notably the substitution of a more elaborate staircase enriched with carved panels, and baroque doorways of the type associated with John Webb. Still greater changes were made by the second earl and first duke of Lauderdale, the virtual autocrat of Scotland from 1661 to 1679. These included suites of reception rooms on two floors, thereby making the S. front a continuous facade. The most important of the new rooms was that known as the Queen's Bedchamber, or Cabal Room—from the tradition that meetings of the notorious ministers (of whom Lauderdale was one) used to meet there. Another notable feature is the Long Gallery, running the length of the W. wing, lined with panelling and hung with Lely portraits. There is a wealth of walnut, lacquered, gilded, and silver furniture, with which Elizabeth filled her rooms, and the superb quality of which indicates that H. H. is the richest surviving example of the sumptuous period dcor of the seventeenth century. One of the most complete of the smaller rooms or closets is the Queen's Closet, adjoining the Cabal Room, with its rich gilt enrichments on a white marbled ground, fl. scagliola fire-place, and silvered chimney furniture. This unique assembly of seventeenth-century furnishings and pictures has been added to the national collections, having been bought by the gov. for £100,000.

Ham, Kamel, or Khamil, tn. of Sinkiang, China, situated in an oasis about lat. 42° 50' N., and long. 93° 28' E. It is an important trading centre. Rice and

fruit are grown in the neighbourhood. Pop. 6000.

Hamilcar, name of sev. Carthaginian generals, the chief of whom was Hamilcar Barca (d. 229 B.C.). During the first Punic war he was in command of the Carthaginian forces in Sicily (247), where he maintained his position on Mt. Hieret^e, near Panormus. After the Rom. victory at the Aegatian Is., which brought the war to an end, he returned to Carthage, where he suppressed a revolt of mercenaries (210–238). In the latter year he went with his young son Hannibal to Spain, and began the conquest of that country, much of which he accomplished during the following years. He fell in battle against the Vettones.

Hamilton, famous Scottish family, who trace their descent back to Walter Fitz-Gilbert (fl. 1255), son of Gilbert de Hamel-done, who is mentioned in a charter of 1272. Walter owned lands in Lanarkshire, and for a time swore fealty to Edward I. of England. After the battle of Bannockburn, however, he joined King Robert Bruce, and was subsequently knighted and granted the barony of Cadzow in Lanarkshire, receiving lands forfeited by adherents to the Eng. crown. His elder son, David, was the first to assume the surname H. His younger son, John, was the father of Alexander II., whose descendants acquired the lands of Priestfield, one Thomas becoming Lord Priestfield in the reign of Queen Mary. Sir David H. of Cadzow, already mentioned, was taken prisoner at the battle of Neville's Cross in 1346, but was ransomed, and sat among the barons in the Scottish Parliaments of 1368, 1371, and 1373. Sir David d. in 1392. Little is known of his son, Sir John H., except that he was twice taken prisoner in England. His grandson, Sir James H. of Cadzow, was likewise taken captive into England, and from him are descended the Hs. of Silvertonhill and of Dalzell. His eldest son, also called James, was created Lord H. in 1445. He was the first layman to found a college in Scotland; as well as endowing a college at Glasgow (1460), he also founded the collegiate church of H. He was connected, by his marriage, with the widow of the fifth earl, with the powerful family of Douglas, whom he assisted in their struggle against James II. About 1455 he changed sides, and on the death of his wife, being now in royal favour, married Princess Mary, sister of James III. and widow of the earl of Arran. His only son, James, by Mary, negotiated the marriage between Margaret Tudor and James IV. of Scotland. In 1503 this James, second Lord H., was created earl of Arran, and succeeded to lands on his mother's side. He d. in 1529, and his heir, James, second earl of Arran (by Janet Beaton, niece to the cardinal), on the death of James V. (1542) was appointed regent of Scotland and governor to the young Queen Mary. In 1549 he was granted the duchy of Châtellerault by Henry II. of France, and resigned from his governorship in favour of Mary of Guise, the queen-mother, in 1554. His eldest son, James, who succeeded to the title in

1575, was proposed at different times as husband for Queen Mary and for Queen Elizabeth, but he lost his reason in 1562 and d. in 1609. His brother, Lord John II., created marquess of H. in 1599, administered his estates until his own death in 1604, when his son James became second marquess. James was created earl of Cambridge (1619), and d. in 1625. The third marquess, James, was created by Charles I. duke of H. (1643) for the signal services he had rendered in the struggle with the Scottish Covenanters. He headed a Scottish army against the Parliamentarians, but was defeated by Cromwell at Preston in Lancashire, and was beheaded at Westminster in 1649. His brother Wm., created earl of Lanark (1639), succeeded to the dukedom. He negotiated with Charles I. at Newcastle (1646), and signed the 'Engagement' at Carlbrooke Castle (1647), fleeing with other Royalists to Holland in 1648. He returned with Prince Charles in 1650, and d. in the following year from wounds received at the battle of Worcester. The second duke of H. was succeeded by his niece, Lady Anne, whose husband, Wm. Douglas, earl of Selkirk (1635-94), was created duke of H. for life only (1660). The Duchess Anne resigned her titles in 1698 in favour of her eldest son, James Douglas, earl of Arran, who was formally created duke of H. In 1711 he was granted an Eng. peerage, being created duke of Brandon. In the following year he fought the famous duel in Hyde Park with Charles, Lord Mohun (see Thackeray's *Esmond*), the principals being killed. His son, James (1703-43), became fifth duke, and he was succeeded by his son James (1724-58), who married the famous beauty, Elizabeth Gunning. The seventh duke, James George (1755-89), succeeded to the title at the age of three. In 1761, by the death of the duke of Douglas, the titles of his family devolved on the Hs. The seventh duke was succeeded by his brother Douglas (1756-99), who sat in the House of Lords. He d. childless, the title passing to his uncle Archibald (1740-1819), whose son Alexander, tenth duke (1767-1852), was ambas. at St. Petersburg in 1806-7. The eleventh duke was Wm. Alexander (1811-63), who married Princess Marie Amélie, a cousin of Napoleon III. His son Wm. Alexander (1845-95) received the anc. title of duke of Châtellerault, granted to his ancestor in 1549. The thirteenth duke, Alfred Douglas (1862-1940), was descended from Claud H., the third son of the fourth duke. From this Claud are descended the dukes of Abercorn, whose eldest sons are styled by courtesy marquess of H. The fourteenth and present duke, Douglas Douglas-Hamilton (b. 1903), is the eldest son of the thirteenth duke. He served in the R.A.F. 1939-45. He was chief pilot of the Mt. Everest flight, expedition, 1933. With Mr. Capt. D. F. McElroy he pub. *The Pilot's Book of Everest* (1936).

See G. Burnet, *Memoirs of the Lives and Actions of James and William, Dukes of Hamilton and Châtellerault*, 1877; J. Anderson, *The House of Hamilton*, 1825; S. R.

Gardiner, *The Hamilton Papers relative to 1638-50* (for the Camden Society), 1880; and Appendix vi. of the *Eleventh Report of the Historical MSS. Commissioners*, 1887. There is a *Briefe Account of the Family of Hamilton* by Dr. James Baillie (early seventeenth century) in MS. in the Advocates' Library, Edinburgh. See also *Scots Peerage* (vol. iv.), 1907.

Hamilton, Alexander (1757-1804), Amer. statesman and economist; one of the men who had most to do with shaping the constitution, policies, and politics of the U.S.A., was b. a Brit. subject in the Is. of Nevis, W. Indies. His father was a Scottish merchant. Misfortunes dogged H.'s parents. His father d. bankrupt, and the boy's mother d. shortly after. At the age of twelve he had to leave school and enter the counting-house of a merchant. But through the aid of friends he was enabled in 1772 to go to a school in Elizabethhtown, New Jersey, and in 1774 he entered King's College, New York city, which afterwards became Columbia Univ. H. proved himself a brilliant pupil, but he left his text-books when the Amer. colonists rebelled against England and identified himself with them. In the campaign of 1776 he acquitted himself so well that he came to the notice of George Washington, commander-in-chief of the Amer. Army. From that time on dated a close companionship, confidence, and friendship with the 'Father of his country' which never abated. Washington appointed him to his staff, and made him his private secretary and aide, with the rank of Lieutenant-colonel. He was given a command and led the Amer. column which carried the first Brit. works at Yorktown. In 1780 the handsome and brilliant young officer had made a great matrimonial match, marrying Elizabeth, daughter of Gen. Philip Schuyler, member of one of the oldest of New York families. H. was a member of the Continental Congress of 1782-83, and then took up the practice of law in New York city. He was one of the delegates from New York state at the Annapolis convention of 1786, and drafted the call for the Federal convention of 1787 at Philadelphia, which was to draw up a constitution for the new-born Amer. nation. He was chosen as one of the New York delegates to this. He was one of the conservative elements in the historic gathering at Philadelphia. He favoured an upper house of Congress chosen for life on a property basis, and a lower house chosen by manhood suffrage. Finding this impossible in the mood of the colonists, he made himself the leader of those who sought to interpolate, and did interpolate, into the constitution as many checks and safeguards as possible. With James Madison and John Jay he wrote the famous series of articles expounding the art of government which were afterwards collected in the classic vol. *The Federalist*. When Washington was chosen as president, H. became his secretary of the Treasury, and outlined a system for the encouragement of home industries which was the precursor of the country's later protective tariff system. In all

things he and Thomas Jefferson, who was secretary of state in the same Cabinet, were at loggerheads. H. was for centralisation of power. Jefferson was opposed to it. H. looked to the leadership of money and property. Jefferson was a thoroughgoing democrat. In a sense H. was thus the father of the Republican party of to-day, and Jefferson of the present Democratic party. Many of the principles they then asserted against each other are to-day the guiding principles of the two great Amer. political parties. H. resigned from office in 1795. His last years were not happy. He indulged in intrigues against John Adams, second president of the U.S.A., and had bitter political quarrels with Aaron Burr for power in New York state. The result of this was a duel with Burr in which H. was mortally wounded, July 11, 1804, dying the next day. His works were pub. by his son in 7 vols., 1851, and by H. Lodge in 12 vols., 1904. See his lives by J. Morse, 1876, and H. Lodge, 1882; and studies by G. Shea, 1877 and 1879, and F. Oliver, 1906. See also Gertrude F. Atherton, *The Conqueror*, 1902.

Hamilton, Count Anthony (c. 1646–1720), Irish-Fr. author; his father was George H., second earl of Abercorn and head of the family of H. in the peerage of Scotland, his mother being Mary Butler, sister of the duke of Ormonde. The place of his birth in Ireland is variously given as either Roscrea or Drogheda. He was carried to France when a child 'and a Frenchman he remained, in all but blood, till the end' (Charles Whibley). His family removed after the execution of Charles I., but the fact that like his father H. was a Rom. Catholic precluded the political advancement he might have expected after the Restoration. On the accession of James II. he obtained the command of an infantry regiment in Ireland and was made governor of Limerick; but after the battle of the Boyne he was again in France as an exile. Though an exile he was much at home, especially as his sister had married the Comte de Grammont, and the rest of his life was spent mostly at the château of his friends. It was at one of these, at Sceaux, that he wrote the *Mémoires* of his brother-in-law, the Comte de Grammont, that made him famous. They give an admirable picture of the court of Charles II. and were pub. anonymously in 1713. With this work H. ranks with the most classical writers of France, and he is the only Eng.-speaking writer who, writing in the Fr. language, has become a classic, with the exception of his collateral descendant, Wm. Beckford, the author of *Vallek* (1815). He also wrote *Le Belin, Fleur d'Épine*, and other tales in imitation of, and as satires on, the romances which Galland's trans. of the *Arabian Nights* had popularised in France.

Hamilton, Anthony Walter Patrick (b. 1904), Brit. playwright, b. in Sussex. Educated at Westminster School. Has written many plays, some of which have been adapted for the radio and for the films. They include *Monday Morning* (1923); *Craven House* (1926); *The Mid-*

night Bell (1929); *Rope* (1929), which was a successful 'thriller' on the radio; *The Plains of Cement* (1934); *Twenty Thousand Streets under the Sky* (1935); *Gaslight* (1939), also most successful as a radio and film play; the radio plays *Money with Menaces* and *To the Public Danger* (both 1939); *Hangover Square* (1941); *The Duke in Darkness* (1942); and *The Governess* (1945).

Hamilton, David (1768–1843), Scottish architect, b. in Glasgow. He was awarded one of the four £500 premiums for his designs of the new Houses of Parliament. He designed and executed many of the modern buildings in Scotland, including the Western Clubhouse and the Exchange at Glasgow, the duke of Hamilton's place in Lennoxhie, Toward Castle, and Lennox Castle.

Hamilton, Sir Edward (1772–1851), Brit. admiral. While in command of the *Surprise* he succeeded in capturing eighty privateers (1797–98), and cut out the *Hermione* from the batteries of Puerto Caballo. He was taken prisoner by the Fr. (1800), but was soon exchanged, and in the following year blockaded the N. coast of France. He was promoted to the rank of admiral in 1846.

Hamilton, Elizabeth (1758–1816), Scottish authoress, b. at Belfast. On the death of her father she was adopted by his sister, Mrs. Marshall, and brought up in Stirling. She subsequently lived in Bath, Harrogate, and London, and d. in Edinburgh. Her works include *Letters of a Hindoo Rajah* (1796); *Memoirs of Modern Philosophers* (a satire on the enthusiasts of the Fr. Revolution, 1801); *Lily of Agrippina* (1804); and *The Cottagers of Glenburnie* (1805), which shows her at her best in depicting domestic life in rural Scotland. See Elizabeth O. Bender, *Memoirs of Mrs. Elizabeth Hamilton*, 1818.

Hamilton, Emma, Lady (née Emma Lyon) (c. 1761–1815), was of humble origin, and in early days was a nursemaid. Her extraordinary good looks brought her many admirers, and she lived under the protection, first, of Sir Harry Fetherstonhaugh, and then of the Hon. Charles Greville. She made the acquaintance of Romney, who painted the well-known pictures of her. From 1786 she lived with Sir Wm. H., the ambas., and married him five years later. While still living with her husband she became the mistress of Nelson about 1794, and in 1801 gave birth to a child, Horatio, of which the sailor was the father. H. and Nelson remained on good terms until the former's death in 1803. In later days Lady H. fell upon evil times, was imprisoned for debt, but contrived to escape to Calais, where she d. in obscurity. There are biographies by J. C. Jeaffreys, 1937, and W. Stichol, 1905. See also E. M. Keate, *Nelson's Wife*, 1939.

Hamilton, Gavin (1730–97), Scottish painter and antiquary, b. at Lanark. He studied painting under Musucci at Rome, where he principally lived. While in London he joined the committee whose object it was to found a royal academy (1735). His excavations at Hadrian's villa at Tivoli, at Civita Vecchia, and elsewhere,

rendered great service to art. His marbles are in the Louvre; his collection of busts and bas-reliefs in the Museo Pio-Clementino in the Vatican. In 1773 he pub. *Schola Italica picturæ*.

Hamilton, Lord George François (1845-1927), Brit. statesman, a younger son of the first duke of Abercorn. He was educated at Harrow. In 1868 he was returned to Parliament by the co. of Middlesex, and subsequently represented the Ealing div. (1885-1906). He received an appointment in the India Office as under-secretary of state (1874-78) from Disraeli, which he exchanged for that of vice-president of the Council of Education (1878-80). He was twice First Lord of the Admiralty, in 1885-86 and 1886-92. In



LORD GEORGE HAMILTON

Balfour's ministry he was secretary of state for India, but resigned office in 1903 on the fiscal question. Chairman of the Poor Law Commission (1903-9). Chairman of Mesopotamia Commission (1916-1917), whose findings severely criticised the organisation of the Brit. expedition up to that date.

Hamilton, Sir Ian Standish Monteith (1853-1947), Brit. soldier; b. at Corfu; eldest son of Col. Christian Monteith H., commanding the 92nd Highlanders; his mother was a daughter of the third Viscount Gort. He was educated at Cheam, at Wellington College, Sandhurst, and in Germany - entering the army in 1873. He served in the Afghan war (1878-80) and the Boer war (1881) - had one arm permanently disabled at Majuba Hill - and took part in the Nile expedition (1884-85), when he was awarded the Khedive's star. He also saw service in the Burmese expedition (1886-87), and with the Chitral relief force under Sir R. Low (1895). In 1897-98 he commanded the 3rd Brigade during the Tirah campaign. In 1898 he went to Hythe

as commandant of the school of musketry. On the outbreak of the S. African war he went out to Natal, and was appointed head of the staff of the Natal field force under the generalship of Sir George White, being present at the battle of Elandslaagte, where he commanded a brigade with the local rank of major-general. He fought with conspicuous gallantry during the defence of Ladysmith, and was promoted to the rank of major-general.

In 1901-2 he was appointed chief of the staff of South Africa to Lord Kitchener, and was put in command of the mobile columns in the W. dist. of the Transvaal. He returned at the end of 1902, having been created a K.C.B., to the War Office with the appointment of military secretary. He had left S. Africa a lieutenant-general, having added to his reputation when so many had lost theirs. He fought with the Jap. troops in Manchuria (1904-5) as a representative of the Indian Army. In 1905 he was given the S. Command; he was promoted full general in 1907, and in 1910 became commander-in-chief of Malta and G.C.B. At beginning of First World War for a while in command of home defence army. In March 1915 he took command of the Mediterranean expeditionary force - i.e. that employed to force the Dardanelles. He landed on Gallipoli peninsula in April. In Aug. a grand effort was only partially successful. The gov. at home, finding H. opposed to withdrawal, had him superseded in Oct. by Sir Charles G. Monro. H. was lieutenant of the Tower of London, 1918-20. Lord rector of Edinburgh Univ., 1932-35. The fact that H. failed in the one campaign in which he exercised high command made no difference to the strong appeal he made to the general public. For the circumstances of the Gallipoli campaign were understood and H.'s tremendous difficulties fully appreciated, while it was generally thought that had he not been starved of resources he might have achieved an outstanding victory. Moreover, his personal charm, intellectual gifts, and versatility made a remarkable impression on his fellow countrymen. While such qualities suggest the brilliant amateur, it was always deeply realised that substantial soldierly qualities were by no means lacking in him; nor did he shrink from bold decisions. In the Gallipoli campaign he contrived that the army should work in harmony with the fleet, and the Fr. expeditionary force which was placed under his orders he handled tactfully and well, and few soldiers of the war emerged better from the ordeal of an international command. Yet with all his gifts and industry H. just failed to be a great soldier. He may have lacked the solid foundations which sustained others or again he may have been one of those whom Napoleon reproaches with seeing too many sides of a problem at once. However that may b. in the Gallipoli campaign, after the Suvla landing, he did not reveal proof of the gift of power to gather into his hands all the loose threads, or to impress his determination on supine subordinates, or turn the fortunes of the day by his own

influence and initiative; while throughout the campaign he was overshadowed by the figure of F.-M. Lord Kitchener—though hero it must be added that to many laymen it appeared that the criticisms to which he was sometimes subjected by the army sprang from the army's own short-sightedness and narrow-mindedness (*The Times*, Oct. 13, 1947). His chief pubs. are *A Jaunt in a Junk* (1884); *A Ballad of Hadji*, and other Poems (1888); *A Staff-Officer's Scrap-book during the Russo-Japanese War* (1906); *Compulsory Service* (1910); *Gallipoli Diary* (1920); *The Soul and Body of an Army* (1921); (with Victor Sampson) *Anti-Commando* (1931); *When I was a Boy* (1939); and *Jean—a Memoir* (1942).

Hamilton, James. *see ARRAN, EARL OF.*
Hamilton, John McLure (1853–1936), Amer. painter, b. in Philadelphia, son of George Hamilton, M.D. He studied in Philadelphia, Paris, and Antwerp, and finally settled in London in 1878. He was chiefly a portrait painter, but in his early work he painted subjects such as 'The Syren' and 'The Hecress.' His prin. portraits are two of Gladstone (in the Pennsylvania Academy of Fine Arts, and the Luxembourg, Paris), Prof. Tyndall (National Portrait Gallery), Cardinal Manning, Herbert Spencer. Pub. *Men I have Painted* (1921).

Hamilton, Patrick (c. 1504–28), 'the protomartyr of the Scottish Reformation.' He graduated M.A. at Paris in 1520, and three years later became a member of Aberdeen Univ. But he came under suspicion on account of his Lutheran sympathies, and fled to Germany. On his return to Scotland (1527) he began to preach at Kincavel and attended a conference at Aberdeen. In 1528 he was brought to trial on a charge of heresy, and was burned at the stake on Feb. 29. His *Loci communes, or 'Patrick's Places,'* setting forth the doctrine of justification by faith, is included in Foxe's *Actes and Monuments*. See life by P. Lorimer, 1857.

Hamilton, William (c. 1665–1751), of Gilbertfield, Scottish poet, b. at Ladyland, Ayrshire. His fame rests on his abridged and modernised ed. of Blind Harry's *Wallace* (1722). He contributed to Watson's *Choice Collection*, 1706, and his 'Willie was a Wanton Wag' was included in the *Tea-Table Miscellany* of Allan Ramsay. He had a verse correspondence with Allan Ramsay which is to be found in the latter's *Works as 'Seven Familiar Epistles which passed between Lieutenant Hamilton and the Author'*, 1719.

Hamilton, William (1704–54), Scottish poet, b. at Bangour, in Linlithgowshire. He espoused the cause of Prince Charlie, and was consequently obliged to seek refuge in France, but returned to Scotland in 1749, succeeding to the family estates at Bangour in 1750. He contributed to Allan Ramsay's *Tea-Table Miscellany*, 1724–27. His finest poem is *The Braes of Yarrow*. The first ed. of his poetry appeared in 1748, and second in 1760. He d. at Lyons, and was buried in the abbey church of Holyrood House, Edinburgh.

See J. Paterson, The Poems and Songs of William Hamilton, 1850.

Hamilton, William (1751–1801), Scottish artist, b. in London. He studied at a very early age under Zucchi, the painter of ornaments, at Rome. R.A. 1789; exhibited from 1774 historical pictures, arabesques, and ornaments, scriptural and Shakespearian pictures, and portraits, including full-lengths of Mrs. Siddons and John Wesley.

Hamilton, Sir William (1788–1856), Scottish philosopher, b. at Glasgow. His father and grandfather had held the chairs of anatomy and botany in Glasgow Univ. In 1807 he entered Balliol College, Oxford, as a Snell exhibitioner, and graduated with first-class honours (1811), taking M.A. degree in 1814. He was called to the Scottish Bar (1813), but devoted his whole time to reading and research. In 1816 he made good his claim to the title of the Hs. of Preston, which had not been used since 1688. He was appointed prof. of hist. (1821) and of logic and metaphysics (1836) at Edinburgh, and in 1829 began his literary career with a criticism of Cousin's *Cours de philosophie*, entitled 'Philosophy of the Unconditioned,' in the *Edinburgh Review*. To this paper he continued to contribute, publishing his essays in 1832–53 under the title *Discussions in Philosophy, Literature, and Education*. His influence was great, not only upon his own countrymen, but in Germany and France. His lectures were pub. posthumously by Profs. Mansel and Veitch (1859–61). Sir Wm. H. pub. an ed. of Reid with seven dissertations (1846), and an ed. of Dugald Stewart (9 vols.), 1854–55, but in all his work he was hampered by ill health, his right side having been struck with paralysis (1814). He invented the doctrine of the quantification of the predicate (to quantify the predicate is simply to state whether the whole or the part only of the predicate agrees with or differs from the subject), urged that the philosophy of common sense is the highest human speculation, and distinguished reasoning in the quantity of extension from reasoning in the quantity of comprehension. See a memoir by J. Veitch (1869), and a study by W. Monck (1881).

Hamilton, Sir William Rowan (1805–65), celebrated mathematician. He came of a Scottish family that had settled in Ireland, and was b. in Dublin. He was a precocious boy, reading Hebrew at seven, and having good knowledge of thirteen languages at the age of thirteen. In later life he read Sanskrit and Persian for recreation. In his early teens he showed extraordinary mathematical ability, and when twenty-three years of age, Dr. Brinkley, the astronomer, said of him: 'This young man, I do not say will be, but is, the first mathematician of his age.' H.'s *Theory of Systems of Rays* was pub. by the Royal Irish Academy in 1828, and made a great sensation among European mathematicians, and he gained in reputation by his subsequent works, which include 'A General Method in Dynamics,' in *Philosophical Transactions* (1834–35) and *The Elements of Quaternions* (1866).

His *Mathematical Papers* were ed. by A. Conway and L. Syngle, 1931. See life by R. Graves, 1882 (new ed. 1903); and T. T. Segorstedt, *The Problem of Knowledge in Scottish Philosophy* (Lund), 1935.

Hamilton, tn. and parl. bor. of Lanarkshire, Scotland, on l. b. of Clyde, 10 m. S.E. of Glasgow. It stands in the centre of a rich coal- and iron-field, and has large foundries and cotton mills, as well as fine public buildings, extensive barracks, and a good race-course. Here also is the ducal palace of the house of H., with its park, part of old Cadzow forest, where wild white cattle are still preserved, and the ruins of the anc^t. Cadzow Castle. Pop. 39,300.

Hamilton, city and port of entry of Ontario, Canada, cap. of Wentworth co., situated at the foot of the Niagara escarpment on the S. side of H. harbour (Burlington Bay), 40 m. S.W. of Toronto and 56 m. W.N.W. of Niagara Falls. It is at the W. extremity of Lake Ontario, and its development was much accelerated after the cutting of the channel between the lake and H. Bay (otherwise known as Lake Geneva and Burlington Bay) between 1823 and 1832. It is an important railway centre on the Canadian National, Canadian Pacific, all Toronto, H., and Buffalo railways, besides being linked with the New York Central and other Amer. lines. It is in the midst of a populous and highly cultivated fruit dist., yet is sometimes styled the 'Birmingham of Canada' on account of its 400 or more factories. It contains many fine residences, particularly those on the summit of the escarpment, and public buildings and wide streets. The most noteworthy buildings are the courthouse, city hall, post office, and public libraries. It is the seat of an Anglican and of a Rom. Catholic bishop. It is also the seat of McMaster Univ., the corporate name of what formerly (1887) were the Toronto Baptist College and the Woodstock College. There are many churches, public and technical schools and collegiate institutes, and three large hospitals. H. has more than forty parks, covering an area of 2 sq. m. Dundurn Castle in the park of that name contains the museum of the Wentworth Historical Society. H. has an important lake commerce, and a good service of steamers, as well as every rail facility for export by land; while a civic airport was constructed before the Second World War. Excellent communications and transportation facilities, combined with cheap power, have made H. a thriving economic centre. Many large industries are located in the city, and some of the largest of these are situated on or near the waterfront. H. is the heart of the Canadian steel industry. Its other manuf's include cotton, woollen, and silk textiles, textile and agric. machinery, motor cars and motor tyres, furniture and glass-ware, wire cables, boots, and tobacco. H. was laid out and settled in 1813 on a plateau at the foot of the 'mountain,' where lies the business quarter of to-day. It was named in honour of the Hon. Robert H. of Niagara, who bought land here in 1813,

and surveyed it as a township. La Salle had already explored the dist. in the mid-seventeenth century. The first dwelling is said to have been a log cabin built in 1778 by Robert Land, a United Empire Loyalist, on what is to-day the very heart of the city. In the year of settlement was fought the battle of Stoney Creek, in the war of 1812, between an Eng. force under Col. (later Sir) John Harvey, and an Amer. force under Gens. Chandler and Winder, in which the Amer. were routed and the two generals captured. The site of this battle has been kept as a public park with a memorial. Pop. 166,300.

Hamilton, cap. of Butler co., Ohio, U.S.A., on Great Miami R., and Miami and Erie Canal, 25 m. N. of Cincinnati. It has paper and flour mills, foundries, breweries, manufactories of farming implements, machinery, woolen goods, and trades in grain, hay, vegetables, tobacco, and live-stock. A branch of the Ford motor works is here. Pop. 50,600.

Hamilton, chief tn. of the cos. Dundas and Northamby, Victoria, Australia. It is situated on the Grange Burno Creek, 50 m. from Portland, and 198 m. W. of Melbourne. Sheep-farming is carried on in the dist., and there are meat-preserving works; frozen mutton is exported. Pop. 5000. Also a vil. in Northumberland Co., New S. Wales, Australia; it is a suburb of Newcastle. Pop. 5000.

Hamilton, cap. of Bermuda, situated on Great Bermuda or Main Is., the largest is. of the group; so named after Henry H., governor of Bermuda when it was incorporated in 1790. It superseded St. George's as the seat of government of the colony in 1815. It is laid out on a rectangular plan on gently rising ground. Almost all the houses are built of rock coral, and have white roofs. The little trains of the Bermuda railway run along Front Street parallel to the water-front. Old-fashioned horse-drawn victorias still ply for hire. Notable buildings in Front Street are the cable office, bank of Bermuda, and Butterfield's bank. On the N. side of the square stand the public buildings erected in 1839, containing the council chambers and gov. offices. On the S. side is the cenotaph, unveiled in 1925 to the memory of Bermudians who fell in the First World War. Near the public buildings is the Sessions House dating from 1817. Its upper part is the House of Assembly and the lower the Courts of Justice. The clock tower of the Sessions House was erected in 1893 to commemorate Victoria's jubilee in 1887. The cathedral of the Holy Trinity replaces the building burned down in 1884; it is a fine structure of indigenous limestone faced with Caen stone for doors and windows; the tower, of Nova Scotian freestone, is 144 ft. high. The foundation stone of the sumptuous H. hotel was laid by Capt. Charles Elliott, R.N., then governor of Bermuda, in 1862. Mount Langton, the governor's residence (1 m. from the wharf) was completed in 1899; it takes its name from an estate in Berwickshire, owned by Sir James Cockburn, governor, 1814-1819. Admiralty House, residence of the

commander-in-chief, W. Indies station, is 1½ m. W. of Mount Langton. Pop. 3000.

Hamilton Bay, see under HAMILTON (ONTARIO).

Hamilton Group, middle div. of the upper Devonian strata of New York; its deposits are of limestones, sandstones, and shales.

Hamilton Mount, California, U.S.A., 41 m. S.E. by E. of San Francisco, with the Lick Observatory, containing the largest refracting telescope ever made. Altitude 4299 ft.

Hamilton Port, group of little is. off S. coast of Korea, occupied by the Brit., 1885-87.

Hamilton, or **Grand**, **River**, Canada, issues from Lake Petchikapou, flows through a chain of lakes below which are the Grand Falls, about 2000 ft. high, and enters the Atlantic through Labrador at H. Inlet.

Hamites (from Ham, son of Noah), anct. African race with some affinities to the Bantus and Hottentots. The term 'Hamitic' is especially applied to a group of African languages, comprising the anct. Egyptian, the Berber, Galla, and cognate surviving tongues. The H. are commonly included among the white races, as also are their neighbours the Semites; but some consider that Hamitism is nothing more than a specialised form of Semitism, and altogether unconnected with the Turanian family. Both Semitic and Hamitic mythologies are derived from the primeval cherubic worship of Eden. The earliest records show the existence of three well-differentiated types, all evidently of mixed Nigritic blood: the dark-skinned, which includes the Galla, Fulabs, and Semai; the reddish-skinned, found among the Egyptians and Bedja; and the blond type, a Berber race. The most advanced culturally of these are the reddish type, found early in the Lower Nile valley, who assimilated some features of Egyptian civilisation. The blond type would appear to have some kinship with the Kabyles mentioned by James Bruce of Kinnaird. The Hamitic tongues comprise the Berber or Libyan, the Egyptian, including the old Egyptian language and Coptic, and the Ethiopian, also known as Cushtic or Punic, which includes the Bedja, Somali, Galla, and other races of Abyssinia and the neighbouring country. Both the Hausa and Hottentot languages have traces of Hamitic structure, a fact which seems to corroborate the older belief of some bygone Egyptian migration southward.

Hamic (**Hamites**), see also **GALLAS**.

Hamlet, hero of one of Shakespeare's greatest tragedies which is founded upon a legend in the *Historia Danica* of Saxo Grammaticus (thirteenth century). Shakespeare, however, owed little but the outline of his plot to Saxo, whose hero, Amleth, only signed his madness and plotted a deliberate vengeance a year before carrying it out. For a discussion of Shakespeare's play and its sources see **SHAKESPEARE**; also R. Latham, *Dissertations on Hamlet*, 1872; C. J. Simrock, *Quellen des Shakespeare*, 1870; and A. Hansen, *Legend of Hamlet*, 1887.

Hamley, Sir Edward Bruce (1824-93), Brit. general and author, b. at Bodmin, Cornwall. He entered the Royal Artillery in 1843, served in Gibraltar, and through the Crimean campaign, where he won special distinction at Inkerman. His articles in *Blackwood's Magazine* brought him literary recognition and led to his appointment as prof. of military hist. at Sandhurst in 1859. His lectures were afterwards pub. as *The Operations of War* (1867). H. was commandant at the staff college (1870-77), and commander of a div. in Egypt (1882), where he took part in the battle of Tel-el-Kebir. He publicly expressed his dissatisfaction at what he considered lack of recognition of his services. From 1885 to 1892 he was M.P. for Birkenhead. See I. Shand, *Life of Hamley*, 1895.

Hamlin, Hannibal (1809-91), Amer. statesman, b. at Paris, Maine. He was admitted to the Bar in 1833, and soon entered the political arena as an anti-slavery Democrat. He was a representative in Congress from 1843 to 1847, and a member of the U.S. Senate, 1848-56, 1857-61, 1869-81. In 1856 he broke with the Democrats on the question of slavery and joined the Republican party, who elected him governor of Maine in the same year. From 1861 to 1865, during the Civil war, he was vice-president of the U.S.A. under President Lincoln. He was minister to Spain, 1881-83. See C. E. Hamlin, *Life and Times of Hannibal Hamlin*, 1899.

Hamm, tn. of Westphalia, Germany, at the confluence of the Lippe and Alse, 22 m. S.E. of Arnsberg. Before the Second World War it had an important iron industry. Near it are thermal brine springs. By the outbreak of the war its industries had much increased, but its chief importance in the war for the Ger. war machine lay in its rail communications, great marshalling yards, and supply depots for the Ruhr industries. Situated, as it is, so close to such great industrial centres of the Ruhr as Dortmund, Bochum, and Gelsenkirchen, and Münster to the N., it was one of the tns. which most suffered in the battle of the Ruhr (q.v.). It was heavily raided by the R.A.F. on July 8 and Aug. 7, 1941 and repeatedly thereafter, being chosen by the Amer. for testing their heavy bombers on March 4, 1943. In the operations of 1945 for the envelopment of the Ruhr, the trapped enemy, under the command of F.W. Model, attempted to strike out from H. in the N. and Siegen in the S., but these attempts, like the co-operating counter-attacks by the Ger. armies outside the 'pocket,' were abortive. Pop. (1939) 60,000.

Hammamet, seaport of Tunis, N. Africa, on the gulf of H., a bay of the Great Syrtis, 42 m. S.E. of Tunis. The harbour is insecure. In the Tunisian campaign of 1943 there was a fierce tank battle at Hammam Lif, where the Brit. were checked on May 8; but they broke through the centre two days later, and by dawn on May 11 they had driven across to H. to seal off the peninsula and bar the road of retreat to the Ger. and It. armies. Pop. 5000. See

further under AFRICA, NORTH, SECOND WORLD WAR, CAMPAIGNS IN.

Hammam-Rirha, watering-place in Algeria in a beautiful mt. dist., having saline and ferruginous springs, near the ruins of Aqua Calida. Pop. 18,000.

Hamm, tn. in E. Flanders, Belgium, on branch of R. Scheldt, 19 m. E.N.E. of Ghent. Pop. 16,400, engaged in agriculture and manuf. of lace, ribbon, oil, soap, textiles, etc.

Hammer, Sir Thomas Bartholomew (1677-1746), Eng. statesman and scholar; received his education at Westminster and Christ Church, Oxford. He entered into political life in 1701, being elected M.P. for Suffolk, and twelve years later he was chosen Speaker of the House of Commons. In 1727 he retired from public life, and gave up his time to the study of literature. He pub. an ed. of Shakespeare in 1744.

Hammer, implement consisting of a heavy head, usually of metal, but sometimes of wood or stone, set crosswise on a handle and used for striking blows; the name is also applied to heavy masses of machinery in which a block of metal is used for the same purpose (see STREAM and POWER HAMMERS). Hs. of stone have been found among antiquities and are still in use among hars. & peoples. The H., more often under its Fr. name of *marteau-de-fer*, was a common weapon in war throughout medieval times. The word is applied to many objects which resemble the common H. in appearance or use, as, for instance, the 'striker' in a clock or in a bell, a part of the sounding mechanism of a pianoforte, the part of a gun which, by its impact on the cap, explodes the charge. It has also been used as a nickname for noted fighters, e.g. 'Hammer of the Scots' for Edward I.

Hammer-head, or Hammer-headed Shark, shark of the family Sphyrnidæ or Zyngidæ, of which the common species *Pygæna malleus* occurs in almost every lat. It is generally from 11 to 15 ft. in length, and is so called from the peculiar shape of its head, which resembles a double-headed hammer laid flat, on the flattened ends of which the eyes are placed. Specimens over 13 ft. in length have been captured round the Brit. coasts, and they abound in all the warmer seas.

Hammer, Throwing the. This anct. sport goes back to the Taitlin games of Ireland in 1829 B.C. Not, however, until A.D. 1866 was it included in the Oxford and Cambridge sports, and in 1900 in the Olympic games. The H. is a round weight attached by a steel wire to a triangular handle, minimum total weight being 16 lb. In 1875 the length was fixed at 3 ft. 8 in., and the throwing space was limited to a 7-ft. circle. The H. is swung three times round the head, and the thrower makes two, three, or four turns within the circle. If the action is performed smoothly the thrower, after releasing the H., remains stationary in the circle and faces the direction in which the H. is travelling. Great technique is required, combined with physical strength, and a weight of about 15 stone or more. The official world records are those of L.

Blask (Germany), 193 ft. 7 in. (1938), and P. O'Callaghan (Ireland), 198 ft. 8½ in. (1937). Brit. national record is 172 ft. 3 in. (C. J. Lindh, Sweden, 1922) and the Olympic record is 179 ft. 7½ in. (M. J. McGrath, U.S.A., 1912).

Hammerich, Peter Frederick Adolf (1809-77), Dan. theologian and author, b. at Copenhagen. In 1845 he became pastor of a church in Copenhagen, and in 1859 was appointed prof. of theology at the univ. of that tu. His prin. historical works are *Danmark i Valdemarernes Tid* (1847); *Danmark under de tre Nordiske Rigers Forening* (1849-54); and *Danmark under Adelsvælden* (1854-59). He also pub. some popular national songs in *Skandinaviske Reiseminder* (1840).

Hammerken, Thomas, see KEMPSIS, THOMAS A.

Hammersmith, W. metropolitan bor. (formed 1809), Middlesex, England, on the R. Thames, 5 m. W. of St. Paul's. H., with Fulham, was the winter camp of the Dan. invaders in 870, and formed part of the par. of Fulham until 1834. Old H. bridge (1824) was the first suspension bridge near London, but was insecure and replaced in 1887. St. Paul's School, originally founded by Dean Colet in 1509 under the cathedral church, was moved to its present site in H. Road in 1883. Other buildings are Wormwood Scrubs prison; Olympia, with its huge arena under a glass roof; the 'White City' buildings and grounds, originally occupied by the Franco-Brit. exhibition of 1908; and the W. London hospital, Kensal Green Rom. Catholic cemetery, in which Cardinal Manning is buried, is also within the bor. Thomson wrote his *Seasons* in H. and Wm. Morris also lived there. Chief industries are iron and dye works, lead and oil mills, boat-building yards, motor works, and distilleries. Pop. 94,100.

Hammerstein, Oscar (1847 - 1919), theatre manager, b. at Berlin in Germany. He migrated to the U.S.A. as a youth and earned living in cigar factory, where he invented a machine for spreading tobacco leaves, which much improved his resources. Founder and editor of *United States Tobacco Journal*. Leased Stadt Theatre, New York, 1870. Built numerous theatres in New York, including Harlem Opera House (1880), Victoria Music Hall (1893), Columbus Theatre (1895), Olympia Music Hall (1895), Republic Theatre (1900), Manhattan Opera House (1906), and Lexington Theatre (1912). In competition with the Metropolitan Opera (1906-10), to whom he sold out (1910). Opened theatres in Philadelphia and London (London Opera House in Kingsway). His nephew Oscar Hammerstein (b. 1895), playwright and librettist, wrote musical plays: *Wildflower* (1923); *Rose Marie* (1924); *Sunny* (1925); *The Desert Song* (1926); *Show Boat* (1927); *Rainbow* (1928); *Music in the Air* (1932); *Carmen Jones* (1943); *Oklahoma* (1943); and 'Arousal' (1945), some of these being written in collaboration. Author of lyrics of many songs: *Ol' Man River*, *All the Things You Are*, *Lover Come Back to Me*, and *Oh, What a Beautiful Mornin'*.

President of the Author's League of America, and vice-president and director of the Amer. Society of Composers, Authors, and Publishers.

Hammerton, Sir John Alexander (1871-1949), Scottish author and editor, b. at Alexandra, Scotland. Went to school in Glasgow, where he began work in a tombstone cutter's yard. Began his editorial career as editor of a temperance weekly, the *Scottish Reformer*. From 1893 to 1900 he was editor successively of a number of Eng. prov. newspapers. In 1900 he came to Fleet Street, doing freelance work in the nature of literary causerie for newspapers and periodicals. Towards the end of 1903 he began a close business association with Lord Northcliffe and the Amalgamated Press, which proved the background of his life's work as an editor of popular works of reference. Among his productions in the ensuing five years were *Punch Library of Humour* and the *Harmsworth Encyclopædia*. He collaborated with Arthur Mee in producing the *Children's Encyclopedia*, the *Harmsworth History of the World* (1907-9), and *The World's Great Books* (1909-10). To H. belongs the chief credit for the practice of issuing encyclopædias and similar works of reference in fortnightly or weekly parts, thereby enabling persons of modest means to purchase them. In 1911 he was appointed managing editor of the *Diccionario Hispano-American*, working on this ambitious undertaking in S. America for seven years. On his return to England he ed. the 2d. weekly *The War Illustrated* (1914) and (with H. W. Wilson) the 6d. weekly entitled *The Great War*—issues of which two works reached 75,000,000 and 11,000,000 copies respectively. His next enterprise was a *Universal History of the World*, but notwithstanding his labours in this field he found time to write books on Barrie, Stevenson, Meredith, and others. Under the auspices of Allied Newspapers Ltd., in association with the Educational Book Company, he then brought out in 10 double vols. a work entitled *The Masterpiece Library of Short Stories: The Thousand Best Complete Tales of all Times and all Countries*, selected by a board of critics, including Wm. Robertson Nicoll, Sir Arthur Quiller-Couch, George Saintsbury, Sir Edmund Gosse, and other eminent writers. In 1939 he again produced a war record work, *The War Illustrated*, which by 1947 reached 255 numbers. His biographies include *With Northcliffe in Fleet Street* (1932)—a frank but fair-minded study—and life of his associate, Arthur Mee. His last work was *The New Universal Encyclopedia* in 10 vols., 1949. H. was an editor of rare skill, with an exceptional capacity for work, combined with a talent for finding capable and sympathetic expert contributors for his numerous productions.

Hammond, Henry (1605-60), Eng. divine, b. at Chertsey in Surrey, and educated at Eton and Magdalene College, Oxford. In 1633 the earl of Leicester presented him with the living of Penshurst in Kent, and in 1643 he was made arch-deacon of Chichester. At the outbreak of

the Civil war he joined the king at Oxford and attended him as chaplain during his captivity. He was deprived of his sub-deanery of Christ Church by the Parliament, and d. in retirement at Westwood, Worcestershire. At Oxford he pub. his *Practical Catechism* in 1645, but as an author he is best remembered by his *Paraphrase and Annotations on the New Testament* (1653). See life by Bishop Frll, prefixed to H.'s *Miscellaneous Theological Works* (Anglo-Catholic Library, 1847-50).

Hammond, James (1710-42), poet and politician, second son of Anthony H. (1668-1738). When about eighteen he was introduced to Lord Chesterfield, and subsequently became one of the clique who surrounded Frederick, Prince of Wales. In 1741, by the influence of the prince, H. was elected M.P. for Truro, but, according to Walpole, was a failure as an orator. Popular tradition said that he d. of a love for Kitty Dashwood, one of Queen Charlotte's maids of honour, whom he addressed as Nema or Della in *Lore Elegies by Mr. H.—nd* (written 1732, pub. with preface by the earl of C—d (C—d being Lord Chesterfield) in 1743), written in imitation of Tibullus.

Hammond, John Lawrence Le Bretton (1872-1949), Brit. journalist, historian, and biographer, educated at Bradford Grammar School and St. John's College, Oxford. Had a distinguished career on Liberal newspapers, including the *Daily News* and the *Manchester Guardian*—for which he wrote leading articles; and from 1907 to 1913 he held the position of secretary of the Civil Service Commission. But he was chiefly known for his historical writings, particularly his trilogy *The New Civilisation, 1760-1832*, written in collaboration with his wife, Barbara H. This work describes the effects of the industrial revolution on the social and economic life of the labouring classes. The first vol. of the trilogy, *The Village Labourer, 1760-1832*, was completed in 1911; the second, *The Town Labourer* (based largely on Home Office papers), was pub. in 1917; and the third, *The Skilled Labourer*, in 1919. The work is distinguished for its research and literary scrupility and carried widespread conviction. His first independent book was a study of the Whig hero, Charles James Fox (1903); but his most impressive piece of independent historical work was a study of *Gladstone and the Irish Nation* (1938), in substance a biography worthy to rank with Morley's standard life. Other works were *Lord Shaftesbury* (1923, in collaboration with his wife); *The Rise of Modern Industry* (1925); *The Age of the Chartists: a Study of Discontent* (1930), an analysis of the specific conditions which resulted in chartism and revised and republished as *The Bleak Age* in 1931; and a biography of the Victorian social reformer, James Stansfeld. After the death of G. P. Scott (q.v.) H. was entrusted by the family with the task of writing a biography of Scott. This work, pub. in 1934, was less an intimate portrait than a study of an influential editor against a broad political background. Both H. and his wife received the honorary

degree of D.Litt. at Oxford in 1933. H. was also an honorary fellow of St. John's, Oxford, a fellow of the Brit. Academy, and honorary D.Litt. of Manchester Univ.

Hammond, Robert (1621–54), soldier, first in the service of the royalists and later in the army of the Parliament. In the struggle between the army and the Parliament in 1647, H. sided with the former, but retired from active service in the same year, and was appointed governor of the Isle of Wight, where the king was in his custody from Nov. 1647 to Nov. 1648.

Hammond, Walter Reginald (b. 1903), Eng. cricketer; b. in Kent. He learned cricket at grammar school, Cirencester. A distinguished member of Gloucestershire Cricket Club. A brilliant bat and fieldsman and a useful length bowler. In May 1927 beat W. G. Grace's month's record, scoring 1028. He scored double 'centuries' in successive innings in test match in Australia, Jan. 1929. In 1932 in New Zealand test match he scored 336 not out. Captain of Eng. test team against Australia in England (1938), having reverted to amateur status. As cricketer H. is unique in his generation. Since the early thirties he has established a long, solitary supremacy to which that of W. G. Grace affords the only parallel. No other man in cricket hist. has headed the Eng. batting averages in six consecutive seasons. Only two others, Hendren and Sutcliffe, have made a hundred centuries in a single decade. H.'s test-match record is superior to all but that of Bradman. Nor, in the field, has there been a better slip-fielder. H. has played for England eighty-four times, making more test appearances than any other cricketer in hist., and in these games he has scored over 7000 runs and taken eighty-three wickets. He was captain in nineteen test matches. See his autobiography, *Cricket My Destiny* (1946).

Hammond, city in Lake co., Indiana, U.S.A., 20 m. S.E. of Chicago. Its chief industries are meat-packing, flour-milling, steel spring, and chemical manufs., and the building of railroad cars. It is served by eight railways, and has a splendid road connection. About 2 m. S. is H. Ford airport. Pop. 65,000.

Hammonton, tn. in Atlantic co., New Jersey, U.S.A., 28 m. S.E. of Philadelphia. It is a popular summer health resort on account of its mineral springs. There are manufs. of cut-glass, shoes, and aluminum. Pop. 7600.

Hammurabi (also written Khammurabi and Ammurapi, and Amraphel in Gen. xiv. 1), son of Sin-muballidh, a ruler of Babylonia. He became ruler in 2370 B.C., and within thirty years succeeded in throwing off the supremacy of the Elamites, and driving them out of Babylon. He then added Larsa and Tamutbal to his kingdom and formed Babylonia into a single monarchy. A great revival of literature seems to have followed and to have been encouraged by the ruler, and he drew up a noted code of laws. See BABYLONIA.

Hamoaze, see PLYMOUTH SOUND.

Hamond, Sir Andrew Snape (1738–1828),

Eng. naval captain, b. at Blackheath, Kent. He entered the navy in 1753; took part in the battle of Quiberon Bay in 1759, and distinguished himself during the Amer. war of Independence, especially in the defence of Sandy Hook (1778), for which he was knighted. In 1780 he was appointed governor of Nova Scotia and commander-in-chief at Halifax. In 1793 he was appointed a commissioner of the navy, becoming comptroller of the navy in 1794, which post he retained, at the special request of Pitt, until his retirement in 1806. From 1796 to 1806 he was M.P. for Ipswich.

Hamond, Sir Graham Eden (1779–1862), Eng. admiral, b. in London, only son of Sir Andrew Snape II., Bart. He was entered on the books of the navy in 1785; served in Lord Howe's flagship at the battle of the First of June 1794; took part in the Baltic campaign; and was present at the battle of Copenhagen, 1801. He was made rear-admiral in 1825, and was commander-in-chief of the S. Amer. station, 1834–38. He became an admiral in 1847, and admiral of the fleet in 1862.



JOHN HAMPDEN

Engraving after a print by J. Houbraken, 1740

Hampden, John (1594–1643), Eng. statesman, entered Parliament at the age of twenty-seven, but first came into prominence in 1626, when he was imprisoned for declining to pay the forced loan raised in that year. He was a leader of the opposition to the arbitrary conduct of the king, and a firm and stalwart objector to ship-money and other methods of raising money, which he regarded as illegal. As a matter of principle he refused to pay the small sum at which he was assessed in respect of his property, but in the courts the judgment went against him. In 1642 he was impeached, but contrived to escape arrest when the king in person came to the House of Commons on Jan. 4 in that year. He took an active part in organising the

parl. army, but early in the Civil war was mortally wounded at Chalgrove Field. His untimely death was a great blow to his party. There are biographies by Lord Nugent (1831), which occasioned Macaulay's famous article, and by John Forster (1837). See H. Ross Williamson, *John Hampden: a Life*, 1913, and *Charles and Cromwell*, 1948; J. Drinkwater, *John Hampden's England* (gives the fuller account of H.'s part in the Civil war), 1933; and C. V. Wedgwood, *Felicit Studies*, 1948.

Hampden, Renn Dickson (1793–1868), Eng. divine, b. in Barbados. He was appointed principal of St. Mary's Hall, Oxford, in 1833; prof. of moral philosophy in 1834; and, in spite of violent opposition, regius prof. of divinity in 1836. His Hampton lectures, delivered in 1832, on 'The Scholastic Philosophy considered in its relation to Christian Theology,' in which he upheld the theory that the authority of scriptures is of greater weight than that of the Church, resulted in a charge against him of unorthodoxy, and a violent controversy ensued. His appointment as bishop of Hereford in 1847 was the signal for another outbreak. His chief works are *Work of Christ and the Spirit* (1847); *Lectures on Moral Philosophy* (1856); and *Fathers of Greek Philosophy* (1862). See *Memorials* by his daughter, Henrietta Hampden, 1871.

Hampole, Richard Rolle (known as the Hermit of Hampole), see ROLLE, RICHARD.

Hampshire, Hants, or County of Southampton, S. maritime co. of England, bounded by Dorset, Wiltshire, Berkshire, Surrey, Sussex, and the Eng. Channel. The coast is broken by the great inlets of Langston and Portsmouth harbours (divided by Hayling and Portsea Is.), Southampton Water, Christchurch and Poole bays. The Isle of Wight is separated from the mainland by the Solent and Spithead. The surface of the co. is diversified by the Downs, rising to 940 ft. in Sidown Hill, and 1011 ft. in Inkpen Beacon, the highest chalk down in England. The N.W. portion of the co., cut off by Southampton Water, is occupied by the New Forest (q.v.), while in the E. are remains of the forests of Bere, Woolmer, and Wallham Chase. The chief rvs. are the Avon, the Test, and the Itchen. The chief industries are agriculture and market-gardening, while Hampshire pigs are famous. The manufs. are unimportant except those connected with the gov. establs. at Portsmouth. The co. is very rich in Rom. remains, and there are many notable monastic buildings and old castles, including Poerchester castle, Carisbrooke castle in the Isle of Wight, Netley and Beaulieu abbeys. A series of commons and manorial wastes on the edge of the New Forest (932 ac. in area), including Bramshaw and Cadnam, were acquired in 1928 by the National Trust. H. (exclusive of the Isle of Wight) returns five members to Parliament, and Portsmouth, Southampton, Winchester, and Christchurch are parl. bors. Other important tns. are Aldershot, Andover, Basingstoke, Bournemouth, and Romsey. Area (including

the Isle of Wight) 1,055,811 ac. Pop. 1,036,000. See the Victoria Co. Hist., *Hampshire*; L. Ball and T. Varley, *Hampshire*, 1908; R. L. P. Jowitt, *Hampshire* (revised), 1949; and B. Vosey-Fitzgerald, *Hampshire and the Isle of Wight*, 1949.

'Hampshire.' Brit. armoured cruiser of the *Devonshire* type (naval estimate 1901–1902), with two torpedo tubes, 21,000 h.p.; 22·5 knots max. speed. It was sunk soon after the battle of Jutland, off the coast of Scotland (June 6, 1916), with the loss of Lord Kitchener and his staff, who were on a secret mission to Russia.

Hampshire Breed, see SHEEP.

Hampshire Regiment. Formerly 37th and 67th Foot, linked in 1881 to form the present regiment. The 37th was raised in 1702, and saw service in Holland under Marlborough and under George II. at the battle of Dettingen. It was at Minden (1759) and in the Amer. war of 1776–77. It gained further laurels at the battle of Waterloo. The 67th was raised in 1756, the famous Gen. Wolfe being its first colonel. After a period of service in the W. Indies it went to Spain in 1810, and served under Wellington during the Peninsular war. During the First World War it raised thirty-six battalions, which served in France, Flanders, Italy, Macedonia, Gallipoli, Egypt, Palestine, Mesopotamia, and Siberia. In the Second World War the H. R. fought in N.W. Europe, and in Italy. A memorial to the men of the four battalions who lost their lives at the Salerno landing and in the subsequent fighting, in Sept. 1943, was dedicated in the chapel of St. Martin and St. George at Pontecagnano, 6 m. E. of Salerno. Other units took part in the bitter fighting, in 1945, in the vicinity of Goch, on the Siegfried line.

Hampstead, parl. and metropolitan bor. and residential suburb of N.W. London. In the early part of the eighteenth century it was famous for its medicinal springs. On the top of a hill (430 ft.) is H. Heath (480 ac.), a favourite resort for Londoners, which affords a splendid view and most bracing air. An old house on the Heath, now a private residence, was the meeting place of the Kit-Cat club, frequented by Steele, Addison, Richardson, and Walpole. Other famous names connected with H. are Pitt, Du Maurier, and Leigh Hunt. Here lived also Hazlitt and Romney. Keats lived in Well Walk. The graveyard of the church of St. John contains a number of monuments of eminent persons, including those of Joanna Baillie, Sir James Mackintosh, and Constable. The chief institutions are the orphan working school, the general and fever hospitals, New and Hackney colleges. The bor. includes the greater part of Primrose Hill to the N. of Regent's Park. H. returns one member to Parliament. Area 2285 ac. Pop. 67,000. See G. A. White, *Sweet Hampstead*, 1901.

Hampton, Wade (1818–1902), Amer. soldier and statesman, b. at Columbia, S. Carolina; educated at S. Carolina Univ. In early life he served in the legislature of S. Carolina, but his views as a Union Democrat were unpopular. He enlisted at

the beginning of the Civil war, and formed and equipped the command of infantry, cavalry, and artillery known as 'Hampton's Legion,' which served with distinction at Bull Run and Seven Pines. H. was prominent at Gettysburg, in the Shenandoah Valley, and in command of J. E. Johnston's cavalry. He was governor from 1876 to 1878, and a senator from 1878 to 1891.

Hampton, cap. of Elizabeth co., Virginia, U.S.A., at mouth of James R., 70 m. S.E. of Richmond. It is served by the Chesapeake & Ohio railway. It has a normal and agric. institute for Negroes, an artillery school, and Army Air Corps headquarters. A strongly fortified naval station and a shipping point for fish and oysters. Pop. 5800.

Hampton, par. in the Spelthorne div. of Middlesex, England, on the N. bank of the R. Thames, 15 m. S.W. of London, now incorporated, for municipal purposes, with Twickenham. Mentioned in Domesday Book, little of note is recorded of H. until early in the sixteenth century. At the time of the Domesday survey (1086) the manor of *Hamptone* was held by Walter de St. Valerio, whose family retained it for a century, when it passed to Henry de St. Albans. In 1411 Lady Joan Groy, probably heiress of de St. Albans, bequeathed the manor to the Knights of the Hospital of St. John of Jerusalem. For three centuries or more the Knights Hospitallers held the manor, their last prior, Sir Thomas Docwra, leaving it to 'the most Reverend Father in God, Thomas Wolsey, archbishop of York,' for ninety-nine years. H. contains many fine private residences, and near it is the old royal palace and park of H. Court (see HAMPTON COURT PALACE). The bridge over the Thames at H. Court opened in 1933 is a beautiful structure with three spans, the centre one being 105 ft. long, and the side spans each 90 ft. The par. church of St. Mary (1830) on the bank of the rly. is built of white brick in the Perpendicular style, with tall rounded windows, which give the sides of the building the appearance of having more glass than brickwork. The organ was the gift of William IV. who, with Queen Adelaide, was then resident at Bushy House on the N.E. confines of the par. Near the porch is the canopied tomb of Mrs. Sibell Penn (d. 1552), nurse to Edward VI. Another memorial is to Richard Tickell, a political writer, who committed suicide in H. Court Palace in 1703. The churchyard contains the tombs of Huntington Shaw (1710), the iron-wright, who constructed the entrance gates to H. Court Palace; George Fitzclarence, first earl of Munster (1842), and sev. fuggets. Here also is interred Mary Clermont of H. Wick, whom Byron castigated in his poem, *A Sketch* (1816), for making mischief between the poet and his wife. At H. Hill, a modern adjunct of H., is the church of St. James, a red-brick building in the Early Eng. style, erected in 1863. A feature of this church is its beautiful spire, built to commemorate the jubilee of Victoria (1887). Mention should also be made of the 'Red Lion' at the corner of Thames Street and Red Lion

Square: the modern hotel stands where forgathered in the sixteenth century many a hunting party, of which Henry VIII. himself was the central figure. Later it was a resort of literary celebrities, including Pope, Swift, Addison, Bellingrove, and Colley Cibber. H. is also noted for its associations with David Garrick. His villa had within its grounds, which fringe the river bank, a domed Grecian temple, which still exists; both temple and lawn have been purchased by the local authority for a public garden. The grammar school, founded 1556 by a local resident, Robert Hamond, is now, under the Education Act, 1944, a secondary (grammar) school; it was gradually enlarged until 1939, when an entirely new school was erected. Pop. 15,000.

Hampton Court Conference. Conference between the bishops and the Puritans which took place at H. C. Palace in 1604. James I., on his way to London, after his accession, was presented with the Millenary petition by the Puritan clergy, demanding the reformation of certain abuses in the Church and the relaxation of certain penalties directed against themselves. James, whose dislike of the Scottish Presbyterians was extended to the Eng. Puritans, had no intention of complying with their demands, which would have involved changes in the Prayer Book unacceptable to the mass of the clergy and a large proportion of the people, and called a conference in which the High Church element so preponderated over the Puritan that the rejection of the latter's demands, with a few trifling exceptions, was a foregone conclusion.

Hampton Court Palace, on the Thames, 15 m. S.W. of London, was built by Cardinal Wolsey in 1515, and was presented by him to Henry VIII. in 1526. Henry VIII. enlarged it and formed a fine deer park around it; and Jane Seymour d. here at the birth of her son, Edward VI. Mary, Elizabeth, Cromwell, and the Stuarts used it as a residence; the H. C. Conference (q.v.) was held here in 1604, and Charles I. was imprisoned in the palace. William III. partly rebuilt it from the designs of Sir Christopher Wren, and laid out the park and gardens in the Dutch style. It was used as a royal residence till the reign of George II., since when it has been lent in suites to well-born pensioners of the Crown. The state apartments are open to the public, and the picture gallery contains some valuable works of lit. art and other masterpieces. The palace is one of the finest extant examples of Tudor architecture, and the park and grounds are of great beauty. N. of the palace is the royal demesne of Bushy Park (1000 ac.). There are three prin. courts. On the E. or garden side, is the Fountain Court, built by Wren. In the centre is the Clock Court, so called from its astronomical clock, made in 1540, but restored by Thwaites in 1879, and still going, with Wolsey's name and motto, 'DOMINVS MICHII ADVITOR' (The Lord is my Helper) immediately above the archway of Clock Court, but beneath the clock. Westward is the Green or Base Court, the largest of

all. From this the Great Gate leads out over the Tudor bridge crossing the moat, rediscovered in 1909. The picture gallery, one of the finest collections in the kingdom, is housed mainly in Wren's buildings round the Fountain Court. The most celebrated pictures are Mantegna's 'Triumph of Julius Caesar' (series of nine), now in the series of contemporary paintings of the Field of the Cloth of Gold; 'Windsor Beauties,' by Lely; 'Cæsar Van der Paue,' by Van Eyck; and specimens of the work of many old masters. The carvings of Grinling Gibbons and the ceilings and fireplaces in many of the rooms are noteworthy. Among the more famous apartments are the Haunted Gallery,



John H. Stone

HAMPTON COURT PALACE

(opened to the public in March 1918). At the end of this gallery is the Great Watch Chamber, with its splendid Flemish tapestries 'Seaven Deadlie Synnes' and 'The Three Fatal Ladies of Destiny.' Beyond is the great hall with its magnificent hammer-beam roof; on its stage plays were performed in James I.'s reign. 'My Lord Cardinall's Lodkynges' lie on the S. side of the Clock Court. The Tudor doorways and fireplaces, oak wall-paneling, and incised devices and inscriptions, all merit attention. The gardens cover 44 ac. The Great Vine, probably planted by 'Capability Brown' in 1768, is in the vine-house. The Great Fountain Garden lies along the E. front, and is named after the fountain which feeds the elliptical gold-fish pond in its centre. The maze (northwards near the Lion Gates) is a well-known attraction. Attached to H. C. P. are two great parks. The nearer is the Home Park (or H. C. Park), almost

the size of Hyde Park and Kensington Gardens together. It was here that William III. was riding when his horse 'Sorrel' threw him so badly that he d. not long afterwards. The second, Bushy Park, is even larger, and its 1100 ac. are cut by the magnificent chestnut avenue, a triple avenue of limes and horse-chestnuts, extending for over a mile along the road to Teddington.

See E. Law, *Hampton Court in Tudor, Stuart, Orange, and Guelph Times*, 1885-1891, and *Masterpieces of the Royal Gallery of Hampton Court*, 1904; Julia Cartwright, *Hampton Court*, 1909; and S. Christina Jerome, *Turn Back the Clock at Hampton Court*, 1949.

Hampton Roads, channel between Chesapeake Bay and the estuary of the James R., Virginia. Two notable naval engagements took place in H. R. during the Civil war. In 1862 the Confederate ironclad, *Virginia* ('Merrimac'), destroyed the Federal frigates *Cumberland* and *Congress*, the other Federal vessels (*Minnesota*, *St. Lawrence*, and *Roanoke*) escaping. Returning the next day to destroy these also the *Virginia* found the Federal ironclad *Monitor* awaiting her. This was the first engagement between ironclads, and the *Virginia* was forced to retire. See 'MONITOR.'

The Hampton Roads Conference was an informal conference held in the cabin of the *River Queen*, near Fort Monroe, in 1865. It was brought about by Blair to try to arrange peace between N. and S. President Lincoln and Seward, secretary of state, represented the Federals, while vice-president Stephens, Senator Hunter, and Campbell, assistant secretary of war, represented the Confederates. Lincoln would only consider peace propositions which ensured complete restoration of the union, and accepted the emancipation proclamation. He disapproved of a joint attack upon the Fr. in Mexico, and the conference broke up without reaching any definite conclusion. See J. Davis, *Rise and Fall of the Confederate Government*, II., 1881; J. G. Nicolay and J. Hay, *A. Lincoln*, x., 1890; Cambridge Modern History, VII., 1903.

Hampton Wick, tn. of England, in the co. of Middlesex, 15 m. S.W. of London Pop. 3000.

Hamster (*Cricetus*), genus of rodent animals of the Muridae family. There are in all nine species, of which the most important is the common H., occurring in certain dists. of Germany, and in parts of Europe and Asia. The H. has a stoutish body with thick glossy coat, short legs and tail, and is about one foot in length. It breeds twice during the year. During the winter it hibernates, living upon its store of food, consisting of roots, grains, and fruits. The H. is a great pest to the farmers of the countries where it abounds, being very destructive to their crops. The male H. is very pugnacious, and will defend itself to the last grasp.

Hamsun, Knut, Norwegian author, b. 1859. Brought up in the Lofoten Isles. After running away to sea he became successively a schoolmaster, a stone-breaker,

a tram-conductor in America, and a journalist. The pub. of his novel *Sull* (1888, Eng. trans. *Hunger*, 1899), won him recognition. Other works are *Lars Ostfeld* (1889); *Mysterier* (1893); *Pau* (1894); *Siesta* (1897); *Redaktör Lyngé* (1898); *Krakow* (1904); *Markens Gröde* (1917) (Eng. trans., *Growth of the Soil*); *Konerne ved Vanposten* (1920) (Eng. trans. *The Women at the Pump*); and dramas. *Norn*, written in 1894, contains beautiful descriptions of sceneries and forest life. Awarded Nobel prize for literature, 1920. A staunch personal friend of Quisling (q.v.) he delivered a long tirade against England during the war, which nation, he declared, he had always hated as the eternal enemy of Europe. See life by O. Skavlaas, 1929.

Hamun, huge shallow trough in Seistan, on the borders of Persia and Afghanistan, is about 100 m. long. It is generally dry, excepting after heavy rains. Two large lakes receive the Helmund, Farsah-Rud, and Harud, at the N. end. The water is for the most part salt.

Han, rlv. of China, trib. of the Yangtze, which it joins at Hankow. It runs through the provs. of Shensi and Hupeh. Length 1300 m.

Han, Chinese dynasty, which was founded by Lin Pang, 202 B.C., and endured till A.D. 220. It reigned in a period when China extended her empire at the expense of the Huns and other W. tribes, and was fruitful in works of literature, notably historical. The introduction into China of Buddhism dates from this era.

Hanaper, office in the court of chancery, now abolished, under an officer called the clerk of the 'hanaper' (Med. Lat. *hanaprum*), a wicker basket or hamper, in which writs and other documents were kept. The office long survived in Ireland, and from the II. were issued writs for the return of members of Parliament. The comptrollers of the II. were abolished in 1842.

Hanau, tn. in Hesse, 13 m. N.E. of Frankfurt, at the confluence of the Kinzig and the Main. There is an old tn. and a new tn.: Protestant refugees founded the latter in 1597, when they came from Holland and Belgium, and introduced woolen and silk manufs. Other pre-war manufs. were carpets, leather, gloves, porcelain, paper, and machinery. Diamond cutting was also carried on, and there was a gov. powder works near. Napoleon defeated the Austrians and Bavarians here in 1813 on his retreat from Leipzig. It is the bp. of the brothers Grimm. Willhabusbad, a watering-place noted for its mineral springs, is in the neighbourhood. In March 1945 II. was used by the Amer. forces of the central group of armies, together with other tns., as a lodgement area from which an advance in strength could be made on Kassel. Pop. 40,000.

Hanbourdin, tn. in France, dept. of Nord, 4 m. S.W. of Lille. Pop. about 6200.

Hancock, John (1737-93), Amer. statesman, b. at Quincy, Massachusetts. President of Prov. Congress, 1774-75. President of Congress, 1775-77. First signer

of the Declaration of Independence. Governor of Massachusetts, 1780-85 and 1787-93.

Hancock, William Keith (b. 1898), Brit. historian and economist, b. in Melbourne. Educated at Melbourne Univ. and, as a Rhodes Scholar, at Balliol College, Oxford. Elected in 1923 a fellow of All Souls College, Oxford. Spent next years in visits to Italy and in research on modern It. hist., publishing his *Ricassoli* in 1926. From 1924 to 1933 he was prof. of hist. at Adelaide Univ., and in 1930 produced his *Australia* (Modern World Series), a survey of the tendencies and forces, political, economic, and intellectual, which are moulding the life of Australia, the survey being avowedly built on the detailed investigations of other writers. Prof. of modern hist. in Birmingham Univ. since 1933. He made his name with his brilliant and monumental *Survey of British Commonwealth Affairs*, written for the Royal Institute of International Affairs. This great work in 3 vols. (vol. 1, *Problems of Nationality*, 1938-39; vol. 2, *Problems of Economic Policy*, 1938-39 (two parts, 1940, 1942)) analyses the constitutional, racial, and economic problems of the Brit. Commonwealth in the two decades between the two world wars. The analysis is based not only on documents, but on the personal investigations which H. undertook between 1934 and 1940 in Ireland, Palestine, Malta, many African colonies, and all the dominions. It is probably the most important book on the Brit. Empire pub. in recent years. His *Argument of Empire* (1913) is a discussion of the problems which may be regarded as those of capital importance to the Brit. Empire.

Hancock, Winfield Scott (1824-86), famous Amer. soldier, b. in Montgomery co., Pennsylvania. In 1844 he graduated from the U.S. military academy and served for two years with the Sixth Infantry in the Indian country. In the Mexican war he fought with credit, and in 1847 was made first lieutenant 'for gallant and meritorious conduct' at Contreras and Churubusco. He served successively as regimental adjutant and quartermaster from 1848 to 1855, and in that year was appointed captain and assigned duty in Florida. At the outbreak of the Civil war H. was appointed brigadier-general of volunteers, and fought with distinction at Williamsburg, Fredericksburg, Chancellorsville, and Gettysburg. In 1866 he received his commission as major-general in the regular army. In 1880 he was democratic nominee for U.S. president, but was defeated. See F. A. Walker, *General Hancock*, 1894.

Hancock, a tn. in Houghton co., Michigan, U.S.A., on the N. of Portage Lake, 1 m. N. of Houghton. A ship canal connects it with Lake Superior. In the neighbourhood are rich copper mines, in connection with which there are smelting furnaces and machine shops. It is a growing summer resort and centre for tourists of the 'Hiawatha' dist. Pop. 5500.

Hand may be defined as a special fore-limb termination distinguished by the

faculty which it possesses of opposing the pollex or thumb to the other fingers, so that small articles may be grasped. The possession of two Hs. was sufficient to classify man as a distinct order, Bimann. It may be thought that four-handed animals (monkeys, etc.) are better equipped than man, but in reality the former lack the intricacy and delicacy of manipulation possessed by the latter, and in the case of the lower animals the fore-hands are needed for locomotion and support.

Bones.—The H. possesses twenty-seven bones, viz. eight carpal in the wrist, roughly arranged in two rows of four each;

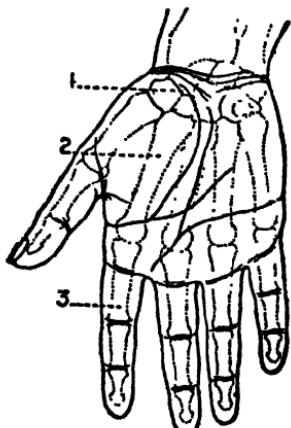


DIAGRAM OF A HAND
1, carpal bones; 2, metacarpal bone;
3, phalanges.

five metacarpals, forming the bony support of the palm; fourteen phalanges of the fingers, the thumb containing two bones and the others three each.

Movements.—The muscular and nervous connections of the H. are of great intricacy. The sev. bones are strongly bound together, each bone being joined to some three or four others. The turning movements are characteristic of the fore-limb and of the human species. The turning of the palm downwards is termed pronation (see ARM), while supination, which is most highly developed in man, is the turning of the palm upwards as for receiving objects. The movements are brought about by the pronator and supinator muscles assisted by the biceps muscle. The greater power possessed in supination has established the thread direction in such objects as screws, girdlets, etc. The flexing of the wrist and H. upon the forearm is brought about by the combined action of three muscles, while the flexing of each finger is caused by two muscles lying along the inner side of the digit, the deeper flexor which is attached to the first phalange

passing through a perforation in the superficial flexor, which is attached to the second phalange—a most ingenious contrivance.

Deformities (congenital) are fairly common in some families, and are marked by excess or lack of digits. The joints are frequently the seat of gout, rheumatism, or rheumatic arthritis, while brittleness of the nails often follows serious illnesses. Right- and left-handedness are usually inherited, but may be the result of practice. An ambidextrous condition is more rare, but may be acquired. The term H. has a variety of uses in current speech, and is used technically as equalling 4 in. in horse measurement.

Hand, in heraldry, is termed either 'dexter,' 'right,' or 'sinister,' loft, and when seen in the escutcheon, signifies equity, fidelity, and friendship.

Handball. 1. Game is probably Celtic in origin, and is suspected to have been one of the ant. Taitlin games of Ireland. The modern version of H., as played chiefly in the U.S.A., has much in common with the Basque game of pelota. It is also something similar to the Eng. game of fives. The court should be about 60 ft. long and 25 ft. wide, and has a front wall of about 30 ft. in height and a back wall of 12 ft. About half-way across the court a line is drawn, called the 'ace line.' Nearer the front wall is another line, called the 'over line' (or 'short' and 'front' respectively). The ball is served against the wall and, to be in play, must land between the two lines. The server scores an 'ace' if his opponent fails to return the ball. Should he return it, however, it is called a 'hand-out,' while if the server misses in his turn, the service then goes to the other player. The winner is he who first scores a number of aces, generally fixed at twenty-one. The National Amateur Athletic Union in America holds ann. singles and doubles championships. 2. Game between two teams of eleven players each, whose object is, by catching and passing, to score by shooting the ball into the opponents' net. Next to football, H. is the most widely played game in Germany, Austria, Switzerland, and other European countries, and is played on a football field in summer and in indoor halls in the winter. The rules are basically the same as for association football but the ball may only be caught, thrown, or punched by hands or arms, and may be carried only three paces by the player. The goalkeeper, however, may play the ball with any part of his body. Penalties for fouls are free throws or corner throws. The ball is 23*1*/₂ in. in circumference and weighs 15*1*/₂ to 17*1*/₂ oz.

Handcuffs, instruments for securing prisoners under arrest, known in the fifteenth and sixteenth centuries as swivels, or manacles. They generally consist of two divided metal rings, connected by a short chain, adjustable to wrists of different sizes, and of recent years several improvements have been made in their construction. A long chain is used to remove gangs of prisoners from one prison to another, connecting the separate H. by

which each prisoner is secured, and made fast at both ends by what are known as 'end-locks.' Some H. are made so that they can be placed on the wrists and immediately secured by a single movement. There are sev. appliances, of recent invention, resembling handcuffs, employed by the police, such as 'snaps,' 'nippers,' 'twisters,' etc., differing from H. in that they are meant for one wrist only, the handle part being held by the officer conveying the prisoner.

Handel, Georg Friedrich (1685-1759), b. at Halle of unmusical parentage, was destined for law, but showed such remarkable talent for music that he was finally permitted to adopt it for a career. He studied under the famous organist, Zachau, and made rapid progress in composition, the organ, harpsichord, oboe, and violin. He became organist at Halle cathedral in 1702; the following year he was engaged as second violin in Keiser's orchestra at Hamburg, where in 1705 he produced his first operas, *Almira* and *Nero*. He next visited Florence, Venice, Rome, and Naples (1706-10), producing operas with considerable success. Similar good fortune awaited him in London, where he produced *Rinaldo* (1711). From this time until his death H. practically remained in England, his closest friends including such men as Pope, Fielding, Arne, and Hogarth, and he was subsequently, in 1726, naturalised. The death of his admiring patron, Queen Anne, the stoppage of his pension (awarded him in recognition of his fine Utrecht *Te Deum*), and the succession of the elector of Hanover, whom he had offended by leaving, caused him much anxiety; but he was restored to favour in 1715, and in 1718 he was made choirmaster to the duke of Chandos. (It should be noted that Newman Flower throws doubts on this story concerning H. and the elector of Hanover.) This post he retained until 1720, composing, meanwhile, the famous serenades *Fcis et Galatea* (1720 or 1721), many anthems, and some harpsichord pieces. His first oratorio in Eng., *Esther*, was also produced with great success (1720). The same year saw the foundation of an operatic company under the management of H. and his rival Bononcini; for its productions, H. wrote over a dozen operas, including *Ottone* (1722); *Tamerlane* (1724), and *Scipione* (1726). On the company's failure (1724) H. organised a similar affair, for which he wrote another dozen operas or oratorios, including *Deborah* (1733); *Orlando* (1733); *Arianna* (1734); *Alcina* (1735); and *Ithaka* (1736). The failure of this venture (1737) brought on an attack of paralysis, and he was forced to go to Aix-la-Chapelle. Shortly after his return in 1737 he forsook opera and turned to oratorio, and from that time until blindness overtook him (1752) he wrought, in fifteen oratorios of unique, unprecedented splendour, the reformation and development of choral composition on which his claim to greatness principally rests, commencing with *Saul* (1739); *Israel in Egypt* (1739), his finest work; and *L'Allegro* (1740). The year 1742 witnessed the production at Dublin of the wonderful

Messiah, which shares with Mendelssohn's *Elijah* the greatest popularity of any oratorio ever written. His chief subsequent works were *Samson* (1743); *Judas Macabeus* (1747); *Theodora* (1750), a beautiful work which has never been appreciated, and, last of all, *Jephtha* (1752). Although of Ger. birth and saturated with It. ideas, H. is remembered purely as an Eng. composer, by reason of the tradition of big choral writing which he founded, a peculiarly Eng. tradition, best exemplified in Elgar and Granville Bantock. It was in England, unfettered by Ger. and It. conventions, that he could best express his ideas, dramatic and devotional. With



GEORG FRIEDRICH HANDEL
Engraving after a picture in the collection
of His Majesty at Windsor

the exception of J. S. Bach, H. far outshone his contemporaries. For the most part he adhered strictly to accepted forms; he had an excellent sense of balance; and his sure instinct for dramatic values was a predominating feature in his operas and oratorios alike. His writings are marvelously fluent, and his skill in contrapuntal choral writing profound; his music is consequently rich in effects at once broad, massive, noble, and inspiring: the ideals of classical oratorio. H. was a very fine performer on the organ and harpsichord, and his instrumental music is still greatly appreciated, e.g. his *Suites pour le Clavecin* (1720, 1733), the *Concerti grossi* (1710), and the organ concerti (1740). See lives by E. J. Dent, 1934; C. F. Williams, 1931, and P. Young, 1947. See also W. Smith, *Concerning Handel*, 1948.

Handfasting (O.E. *handfæstung*), custom long prevalent in Scotland, whereby man and woman could pledge themselves to each other for a year and a day by the joining of hands. If at the end of that time the woman was neither a mother nor pregnant, the man need not make her his

wife. Sir Walter Scott describes the custom in his novel, *The Monastery*. It was the means of bringing about great evils in society, and many injunctions were directed against it by the clergy both before and after the Reformation.

Handicap, in games and sports is a disadvantage placed upon the abler competitor in order to reduce the participants to equality and thus afford a closer contest. There are many methods of handicapping, depending upon the nature of the contest. In foot races the best runner has to cover a greater distance, in billiards the better player to score a greater number of points. In yacht races a shorter time is allowed, while in shooting matches a greater range is fixed. In such games as draughts and chess the better player is deprived of some of his pieces, and loses one or more moves at the beginning of the game. Cricket matches are common in which one side takes the field with more than the usual number of men. Handicapping is general in horse-racing, where the weight a horse has to carry is fixed in proportion to his quality. This practice originated at the beginning of last century and at first took the form of a H. according to the horse's age. The handicappers are licensed by the Jockey Club, and upon the pub. of the weight to be carried owners have the option of withdrawing their horses from the contest without losing their entrance money. The weight to be carried is carefully taken into account in estimating the chances of the horse winning the race.

Handley, Thomas (1894-1949), Brit. radio comedian, b. at Liverpool. At one time a commercial traveller by day and an entertainer by night. During the First World War he served with a kite balloon section of R.N.A.S. After the war he joined a concert party and appeared in music-hall sketch, *The Disordly Room*, which was given a place in the Royal Command performance of 1923. First radio engagement, 1926, and subsequently took part on the air in revue, vaudville, operetta, pantomime, and other items. The feature, however, in which he had his greatest success was 'Itma' ('It's That Man Again')—words first applied to Hitler. In this feature, through which his name became known over the whole country, he owed much to the talents of a well-chosen team, and still more to the script-writers; but the feature owed as much to H.'s outstanding personality—a personality humorous, ebullient, kindly, and sincere. H.'s own part was that of an *enfant terrible* in a topsy-turvy world, with an outrageous assurance and an optimistic philosophy at the back of it all. During the Second World War and after, in affliction, in triumph, and in austerity 'Itma' typified the spirit of the British nation. H., the man to whom everything happened, who resourcefully emerged from every ordeal, whose cheerfulness, friendliness, and sanity never failed, was the man that his millions of listeners in their inmost hearts felt themselves to be. This explains his universal popularity and the grief at his sudden death. A

memorial service was held at St. Paul's Cathedral.

Hands, Laying on of, religious ceremony used to accompany various sacramental and other rites. Instances of the ceremonial imposition of hands are numerous both in the O.T. and N.T., and the custom has been continued to the Christian Church. In the Early Church it accompanied confirmation, absolution, ordination, and a number of minor rites and benedictions. The Gk. Church no longer retains it for confirmation, and the Rom. Church does not make use of it in absolution.

Handsworth: 1. Par. and vil. in the W. Riding of Yorkshire, 4 m. S.E. of Sheffield; has quarries, nurseries, and collieries. Pop. 16,000. 2. In Warwickshire, is a suburb of Birmingham, between Birmingham and W. Bromwich.

Hand-tree, see CHEIROSTEMON PLATANOIDEA.

Handwriting, see WRITING.

Handwriting, Study of, see GRAPHOLOGY.

Hanford, city in King's co., California, U.S.A., 20 m. W. of Visalia, is the centre of an oil dist. It is also the shipping depot for distributing agric. produce. There are also granite works, mills, and foundries. Pop. 8200.

Hangchaufu (*Hangchowfu*), cap. of Chekiang prov., China, on the Tsin-tau-kiang, which flows into Hangchow Bay. It is the Kinsai, Kingtse, or Quinsay of Marco Polo, at the S. terminus of the Imperial or Grand Canal. In Marco Polo's day H., which he calls Kinsai, had a garrison of 30,000 soldiers and contained '600,000 families.' Noted for trade in silk manufs., fans, and gold-embroidered stuffs, and as a literary centre; the port was opened to foreign commerce, 1896. H. was the cap. of the S. Sung dynasty, 1127-1278 and was held by the Tai-pings, 1861-64. Near by is Lake Shiu. A railway to Shanghai (110 m. distant) and Ningpo has been constructed. The estuary tides below Hangchow, causing the 'Hangchow bore,' considerably hinder navigation. During the civil war in China H. was occupied during the Lower Yangtze campaign in 1926, and when the Nationalists made Nanking their cap. it became very important as the port of that city. Fell to the Jap. on Dec. 24, 1937. In the civil war following the Second World War H. was abandoned by the Nationalists to Communist troops in May 1949. Pop. (municipal area) (1936) 506,000. See A. F. Moule, *Notes on Hangchow*, 1889; E. R. Seidmore, *China the Long-lived Empire*, 1900; and *Marco Polo* (Yule's ed.), 1874.

Hanging, see CAPITAL PUNISHMENT.

Hanging Gardens of Babylon, structure of ant. Babylon, famed as one of the Seven Wonders of the World. It was probably made by order of Nebuchadnezzar (604-561 B.C.) to please his Median queen, Amytis. It appears to have been a kind of tower or pyramid rising in terraces over a square, about 4 ac. in area. The terraces rested on arches supported by hollow pillars (75-300 ft. high), and were planted with trees, shrubs, groves, and flowers. Fountains and banqueting-halls

were interspersed. Water was pumped up from the Euphrates for a reservoir at the top, from which the gardens were irrigated. The story ascribing them to Semiramis has no historical foundation. Probably the N. portion of the mound Amran ibn Ali is on the site. See *Diodorus*, II. 1; *Strabo*, XVI. 1, 5; and G. Rawlinson, *Ancient Monarchs*, II. and III., 1862.

Hangnest, name for birds of the sub-family Ictericidae, sometimes called troupias or orioles, resembling finches. (Webster gives the scientific name as *Icterus galbula*.) They are brilliant black and yellow in colour, and good songsters, found especially in the tropical parts of S. America, where the *Cassicus* and *Ostryops* genera abound, and in N. America, where they are known as hang-birds in many parts. Their purse-like nests, sometimes 2 ft. long, hang from branches, with an entrance near the bottom to one side. These passerine birds of America are related to the starlings and weaver-birds of the E. hemisphere.

Hangul, see RED DEER, KASHMIRI.

Hanhai (dry sea). Chinese name for a great tract of desert in central Asia. It is an area of inland drainage, divided by hills into the basin of the Tarim and the desert of Gobi.

Hankey, Sir Maurice Pascall Alers, first Baron, Brit. soldier and gov. servant; b. April 1, 1877; third son of Robert Alers H., S. Australia. Educated Rugby. Joined Royal Marine Artillery, 1895. In H.M.S. *Ramillies*, Mediterranean, 1899-1901; naval intelligence dept., 1902-6; intelligence-officer, Mediterranean, 1907; secretary Committee of Imperial Defence, 1912-38; secretary, war Cabinet, 1919-38. Retired from fighting service as lieutenant-colonel, 1918; G.C.B., 1919. Secretary-general of Imperial conferences, 1921, 1923, and 1926. Brit. secretary, Peace Conference, 1919; Washington Conference, 1921; Geneva Conference, 1922; and London International Conference on Reparations, 1924. Clerk of Privy Council, 1923-38. Secretary-general, London Naval Conference, 1930. Minister without portfolio in Nevile Chamberlain's Cabinet, 1939; chancellor of duchy of Lancaster, 1940. Paymaster-general, 1941-1942.

Hankiang, or Hangkiang, riv. in China, rises in the mts. of Tsinling in the Shensi prov. It then flows through Hupe, and enters the Yantze at Hankow. It is 900 m. long, and navigable for small boats for most of its course. The country it drains is rich in minerals, and thickly populated.

Hankow, Hankau, or Hankeu, treaty port (since 1861) of Hu-peh prov., China, at the confluence of the Hankiang and the Yangtze. Hanyang (with large iron-works) is opposite across the Han, and Wuchang across the Yangtze. The Taiyeh iron deposits near H. are among the richest in the world. Before the Second World War they were mainly controlled by Jap. and large quantities were exported to Japan. There are also deposits of gold, silver, lead, zinc, antimony, coal,

salt, limestone, etc., in the neighbourhood. It was opened to foreign trade in 1862. The city was walled round in 1863. In normal times H. is the chief emporium of central China, exporting tea, antimony, ore, hides, ramie fibre, beans, silk, tobacco, wood-oil, and Chinese medicines. The railway between H. and Peking was completed in 1905, and that between H. and Canton (768 m.) in 1931. Before the Second World War there was a good daily steamship service between H. and Shanghai and a weekly one between H. and Ichang. The tn. has been submerged (1866, 1869, and 1870), but structures to prevent the rise of the riv. have been built along the riv. frontage of the Brit. settlement. There are telephones and telegraph in H., and it is lighted by electricity. Ever since the outbreak of revolution H. has been the scene of disturbances and crops have been continually ruined by fighting soldiers—thus decreasing the Yantze products which are all shipped through the port of H. In 1919 there was a tremendous increase in trade amounting to over 227½ million taels. But in 1926-27 H. suffered very much. The port was occupied for some time by the Communists and there was much rioting, and danger to Brit. subjects. A detachment of Brit. marines were landed there for their protection. In Aug. 1938 H. was heavily bombed by Jap. aeroplanes. By mid-Oct. the Jap. had advanced to Sinyang, a keypoint on the Peking-H. railway, only 125 m. N. of the city; and on Oct 28 Marshal Chiang Kai-shek evacuated H. As the Japs neared the city a general evacuation was ordered, and the main official buildings, public utility plants, and centres of communication, as well as all Jap. property, were blown up by the Chinese. Jap. forces entered the city on Oct. 25, but were driven out by victorious Chinese and Amer. forces in 1945. In the civil war following the Second World War H. was taken by Communist forces on May 16, 1949. Pop. 778,000. See CHIN.

Hanley, centre of the pottery dist. of Staffordshire, is situated 1 m. N.N.E. of Stoke-upon-Trent; it was made a municipal bor. in 1857, a parl. bor. with one incmb. in 1885, and a co. bor. in 1888. In 1910 it amalgamated with neighbouring tns. to form the municipal bor. of Stoke-upon-Trent. Large coal and iron mines are found in the neighbourhood, and extensive steel and iron industries are carried on. The manuf. of earthenware, for which the tn. is famous, includes the finest kinds of porcelain. Pop. 66,000.

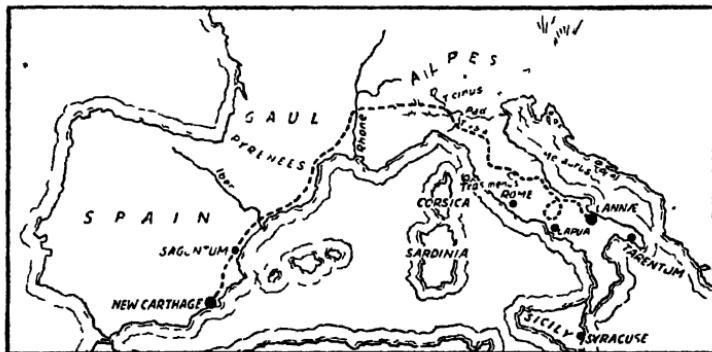
Hanna, Marcus Alonzo (1837-1904), Amer. politician and steel and coal magnate, b. at Lishon, Ohio. Delegate to several national Republican conventions; was instrumental in securing election of McKinley. Chairman of National Republican Committee. U.S.A. senator, 1897-1901. During the term of President McKinley he was the most powerful politician in the U.S.A., and was at one time talked of as the Republican nominee for president.

Hannah, wife of Elkanah the Ephraimite (1 Sam. I.), to whom, in response to

prayer, a son, Samuel, was given. She had vowed to devote her son to the Lord, and so the child was taken to the temple at Jerusalem.

Hannay, James Owen (George Birmingham) (b. 1865), Anglo-Irish novelist, son of Rev. Robert Hannay, D.D., vicar of Belfast. He was educated at Temple Grove, E. Sheen; Haileybury; Trinity College, Dublin. Took priest's orders in the Irish Protestant Church in 1889; curate of Delgany (co. Wicklow); rector of Westport (Mayo), 1892-1913; canon of St. Patrick's, 1912. Chaplain to Legation, Budapest, 1922-24. Since then rector of Mells. He began his writing with serious novels of Ireland: *The Seething Pot* (1905); *Hyacinth* (1906); *Benedict Kavanagh* and *The Northern Iron* (1907);

the Celtiberian tribes, and before 219 he had reduced all the country S. of the Iberus, with the exception of Saguntum. In the spring of that year he laid siege to Saguntum, which surrendered after a resistance of eight months. The Rom. having made an alliance with that city, regarded H.'s action as an intentional provocation to war, and demanded his surrender, which, being refused, war was formally declared between the two nations. H. prepared his army in the winter of 219, and left Spain in the following spring with some 90,000 foot, 12,000 horse, and fifty elephants (Polybius, III. 31, 18). In the early summer he performed his brilliant march across the Alps, and on reaching N. Italy defeated Publius Scipio at Trebia and at Trebia. After spending some



THE ROUTE OF HANNIBAL

The Bad Times (1908). But in the last-named year came also *Spanish Gold*, introducing the Rev. J. J. Meldon, an outrageously eccentric Protestant parson, who was so popular that he returned again and again in Birmingham's lighter stories. His more recent works of fiction are *Old Justice* (1930); *The Silver-gilt Standard* (1932); *Two Fools* (1934); *Mrs. Miller's Aunt* (1936); *Appearance* (1939); and *Over the Border* (1942). He has also written on Christian monasticism and notable murders. Other pubs. include *Isaiah* (1937); *God's Iron: A Life of the Prophet Jeremiah* (1939); and he ed. *Irish Short Stories* (1949).

Hannibal (247-183 B.C.), celebrated Carthaginian general, the son of Hamilcar Barca. He was educated in his father's camp, and trained in all the arts of military warfare. He was taken to Spain when only nine years old, and there upon an altar made an oath to his father of eternal hostility to Rome. On his father's death (229 B.C.), Hasdrubal, the son-in-law and successor of Hamilcar, placed him in command of the troops in Spain, and in 221, on the assassination of Hasdrubal, he was unanimously proclaimed by the soldiers the ruler of Carthaginian Spain, his election being later ratified by Carthage. H. crossed the Tagus and subdued

months in winter quarters, he marched into Etruria early in 217 to the banks of the Arno. The Carthaginian army endured great suffering from the unwholesome swamps, and H. himself lost the sight of one eye. The Rom. army under Flaminius was encamped at Arretium, which H. passed by on his way S. Flaminius hurried in pursuit and fell into an ambush near Lake Trasimene, the Romans being practically wiped out, and the consul slain. Rome now elected dictator Q. Fabius Maximus, who, on account of his caution, won the name of 'Cunctator.' He continually harassed the Punic forces, without risking a general engagement. H. marched S. to Capua and into Apulia. In 216 he encountered ~~Emilius~~ Paulus and Terentius Varro, and inflicted a most crushing defeat upon the Romans on the b. of the Aufidus, below Cannæ. He wintered in Capua, and several S. ins. revolted from Rome to his side. It has been said that the luxury prevailing in Capua enervated his troops; whether this be true or not, 216-215 mark the turning-point of his career. H. obtained some successes in the S., taking Tarentum in 212; but he did not feel himself strong enough to attack the citadel of Rome until his army was reinforced. His brother, Hasdrubal, approached with his troops

from Spain, but at the R. Metaurus met the Rom. army under Liviis and Claudius, and with most of his men was slain. H. maintained his ground in the wild, mountainous region of Bruttiom from 207 to 203, in which year he was recalled to Africa on the success of the younger Scipio. In 202 he met Scipio at Zama, where he was defeated for the first time. He urged his countrymen to make peace with Rome and himself signed the treaty which forbade Carthage to wage war outside her own dominions without permission from Rome (201). The Romans continually urged the banishment of H., and it was felt in Carthage that the family of Barca was too great for the state. In 195, compelled by the jealousy of factions at home as well as by the enmity of Rome, he sought refuge with Antiochus III, king of Syria, who was allied with Egypt against Rome. Antiochus was defeated at Thermopylae (191) and at Myonnesus (190), and H., fearing to be given up as a hostage of war, fled to the court of King Prusias of Bithynia. In 183 Rome sent Quintus Flamininus to demand the surrender of the fugitive, and, accordingly, to escape being placed in the hands of his enemy, H. took poison. H. is a great figure in the hist. of the world. His army was composed of mercenaries of many nationalities—Africans, Spaniards, Gauls, and Ibs.—yet he retained their confidence during sixteen years of hardship and privation in a foreign land, never having a single mutiny in camp; and long after the veterans that had followed him over the Alps had dwindled to a mere remnant, his new levies were still as invincible as their predecessors. He was an extraordinary organiser, and trained his mixed bands into a most efficient whole. The second Punic war may more fitly be called the Hannibalic war, for he is the one prominent figure throughout it. For military strategy and statesmanship he can only be compared with another great hero of hist., Napoleon Bonaparte. See 'The Second Punic War,' chaps. 42–47 of Thomas Arnold's 3-vol. *History of Rome*, 1838–43 (ed. by W. T. Arnold, 1886); E. Hennebert, *Histoire d'Anibal*, 1870–92; W. Morris, *Hannibal*, 1897; A. R. Bonus, *Where Hannibal Passed*, 1925; E. Groag, *Hannibal als Politiker*, 1929; and G. P. Baker, *Hannibal*, 1930.

Hannibal, city of Marion co., Missouri, U.S.A., situated on the r. b. of the Mississippi; it is an important railway centre and riv. port, and carries on an extensive trade in lumber, flour, cattle, cement, tobacco, etc. The Atlas Portland Cement plant is situated here. There are also coal mines. It is connected by six important railways, and has a good steamboat service. Mark Twain spent his boyhood in Hill Street. Pop. 20,800.

Hanno the Great (*fl.* third century B.C.), leader of the peace party at Carthage, and an opponent of Hamilcar and Hannibal. He was unsuccessful in his command over the rebellious Carthaginian mercenaries (241 B.C.), and after the battle of Zama (202 B.C.) went on a deputation to Scipio to sue for peace.

Hanno, Carthaginian navigator, who flourished about 500 B.C. His *Periplus* is an extant Gk. trans. of his account of a coasting voyage he undertook along the W. coast of Africa. The date of the voyage has been assigned to about 470 B.C. H. founded colonies and trading stations, and explored the country. The original account was inscribed in Phoenician on a tablet and placed in the temple of Melkarth. The authenticity of *Periplus* has frequently been discussed. See T. Falconer, Eng. trans. (1797); A. Mer, *Mémoire sur le périple d'Hanno*, 1885; and an essay by C. T. Fischer, 1893.

Hanoi, or Ke-sho (*i.e.* a prov. surrounded by rvs.), cap. of Tongking and Fr. Indo-China, on the r. b. of the Song-koi or Red R., about 80 m. from its mouth in the gulf of Tongking. The modern tn. is European in appearance, and lies to the N. of the picturesque native quarter which is built round a lake. Its avenues of flowering trees give to H. its special character. In 1897 the Pont Doumer, a great steel bridge, was constructed to span the Red R., so as to connect H. with the adjacent provs., over 1700 metres of a torrential riv. H. is in communication with Haiphong, both by rail and steamer, and by rail with the Chinese frontier. The development of the railway communications from H. to Saigon and elsewhere owed much to the Fr. governor-general, Paul Doumer (g.v.). There is an airport at H. In 1902 a school of medicine for natives was opened; this, in 1917, with other higher education schools was formed into the univ. of Indo-China or H. H. has (since 1918) a large European college. The H. school of medicine is the best and oldest of the higher educational institutions of Indo-China. The univ. also includes a normal school, and a section of pedagogy. There is also a native lycée at H. The law school was instituted as a separate faculty in 1931, previously to which the law had been combined with literary studies. Medicine and law are the only two faculties of H. Univ with a high standard and of unquestioned utility. The chief industries of H. are cotton spinning, brewing, and distilling, and the manuf. of tobacco, earthenware, and matches, with native metal-work, jewellery, and silk embroideries. A Chin-ese consulate was estab. in H. in 1936, and in the same year an air service linked H. with Canton. After the capture of H. by the Fr., the Fr. authorities came upon some books in Chinese characters about the great mineral resources of Tongking and revealing that the court at Hué had received revenue from 123 mines. H. has often been the centre of native risings, as in 1905, and again in 1946–47, in which latter period the Viet Minh party which controlled the gov. of the new republic of Viet-Nam, were in conflict with the Fr. forces, the issue, as always, being the Tongkingese desire to be independent. Pop. 120,000. See Virginia Thompson, *French Indo-China*, 1937.

Hanotaux, Albert Auguste Gabriel (1853–1944), Fr. statesman and historian, educated at St. Quentin College. He won

the notice of Gambetta by an article in *La République française*, obtaining a post in the Foreign Office, and later in the Cabinet. He was deputy for Aisne, 1886-89, and minister for foreign affairs, 1894-98. H. wrote *Henri Martin* (1885); *Études historiques sur les XVI^e et XVII^e siècles en France* (1886); *Histoire du cardinal Richelieu* (vols. I. and II.) (1893-1903), which won the Gobert prize; *L'Énergie française* (1902); *Du choix d'une carrière* (1902); *Histoire de la France contemporaine, 1871-92* (9 vols., 1903-8); *La Paix latine*, (1908); and *Histoire de la nation française* (15 vols., 1920-24).

Hanover: 1. (Ger. Hannover), formerly a separate kingdom in N. Germany, was made a prov. of Prussia in 1866. In 1918 the prov. was assigned to the Brit. zone of occupation as part of Lower Saxony. It lies between Holland on the E., the R. Elbe on the W., the North Sea on the N., and Westphalia and Brunswick on the S. Its area is 14,800 sq. m., and its pop. (1939) 3,211,000. The inhab. are nearly all Lutherans, but before the First World War there were some 300,000 Catholics. H. is mountainous in the S., where elsewhere it is flat, and contains large stretches of moors and heath, including the great Lüneburg Heath between the Elbe and the Aller. Besides these two streams it is also watered by the Weser, Ems, and Leine. Agriculture is carried on in the riv. valleys, where the soil is fertile; cattle-breeding on the heaths and marshes; and mining in the Harz Mts., where coal, iron, zinc, lead, silver, copper, and salt may be obtained. Shipbuilding and other seafaring industries were carried on along the coast. The most important industries before the Second World War were the manuf. of iron and steel goods, textiles, glass, paper, machinery, chemicals. The is. of Norderney and Borkum serve as seaside resorts. There is a univ. at Göttingen. The cap. is H. (see below). The hist. of H. was extremely disturbed until the year 1705, when George Louis reunited the two duchies of H. and Celle. In 1714 he became king of England as George I., and the duchy belonged to the Eng. kings until 1837, when, upon the accession of Queen Victoria, H. went to the next male heir, Ernest Augustus, duke of Cumberland, fifth son of George III. In 1866 H. sided with the Austrians against Prussia, but its army was defeated and captured at Langensalza, and the duchy incorporated with Prussia. 2. The cap. of the former prov., situated close to the Leine, a sub-trib. of the Weser, 82 m. S. of Hamburg, and 102 m. W. of Berlin. It is now the cap. of Lower Saxony. It stands at the junction of the railway lines from Cologne to Berlin and from Hamburg to Frankfort. The tn. consists of the older portion, dating from the fifteenth and sixteenth centur.'es, with narrow streets and old-fashioned houses, and the modern additions to the N. and E. On the E. are the extensive woods of Eilenriede, while close to the tn. are the palace and grounds of Herrenhausen. Apart from the old buildings, such as the old tn. hall (1439), the royal palace, and the house of Leibnitz,

H., before the Second World War, had many fine modern buildings, the railway station being considered one of the finest in Germany, while the Kestner museum of archaeology, the tn. hall, and others were worthy of note. The pre-1939 industries were iron-founding, type-founding, India-rubber goods, machinery, hardware, linen, and brewing. During the fourteenth century the tn. was a member of the Hanseatic League, but subsequently declined in importance until the latter half of last century, when its manufs. developed. In the allied air attacks on H. all the important buildings were damaged. All H.'s industrial potential of buna or *ersatz* rubber, textiles, etc., was destroyed. The huge Gothic Rathaus, an ugly building of the nineties, was badly damaged. One of the few intact objects in the city was the statue of King Ernest Augustus of Hanover, cousin of Queen Victoria, intact even to the plume on his busby. The arrival of the allied forces in 1945 released great numbers of foreign slave workers and Brit. prisoners of war, and probably those together outnumbered the Ger. civilians still remaining in the tn. See K. F. Leonhardt, *Ursprung und Entwicklung der Staat Hannover*, 1933. Pop. (1939) 470,900. 3. Magisterial dist. in N.E. of Cape Prov., S. Africa. The chief tn., H., 420 m. E.N.E. of Cape Town, and 40 m. S.E. of De Aar Junction, is known for its sulphur springs. 4. Bor. in York co., Pennsylvania, U.S.A., 42 m. N.W. of Baltimore. It is served by the Pennsylvania and W. Maryland railways. Manufs. of machinery, shoes, and cigars; there are also silk and flour mills, machine shops, ice and canning factories. Surrounded by rich agric. region. It was incorporated as a bor. in 1815. Pop. 423,000.

Hansard, Luke (1752-1828), printer, b. at Norwich, and educated at Boston grammar school. He came to London and entered the office of John Hughes, printer to the House of Commons, as compositor. In 1774 he became a partner and acting-manager, and began to print the journals of the House of Commons. Subsequently his two sons entered the business, and after their father's death they and their sons continued as printers to the House of Commons. Luke H. was buried in the par. church of St. Giles-in-the-Fields.

Thomas Curson H., who printed *Cobbett's Parliamentary Debates* (founded in 1800), became the owner of that pub. in 1829, renaming it *Hansard's Parliamentary Debates*. T. C. H. d. in 1833, and was succeeded by his son, T. C. H. the second. The name *Hansard* disappeared from the *Parliamentary Debates* in 1889, when T. C. H. sold his interest to the Hansard Publishing Union (Bottomey). The *Official Report* of parl. debates reverted to its old name of *Hansard* as the result of the recommendation of the House of Commons' Select Committee on Pubs. and Debates Reports, which, in a special report, states that the committee passed a resolution that 'the word *Hansard* should appear upon the title page of the *Official Parliamentary Debates*'. But irrespective of this reversion, the *Debates* or *Official*

Hansard, Report had for years been known simply as 'Hansard,' the name being looked upon as a synonym for reports of parl. debates, a fact which is illustrated by the analogy of colonial debates which, in some cases, as, e.g. in Ceylon, have long been known as *Hansard*.

Hanseatic League, medieval federation of N. Ger. cities which for centuries was of great commercial and political importance. Germany's foreign trade dates from very early times; in England, for example, Ethelred II. (978-1016) granted to 'the emperor's men' equality with Eng. merchants in trading privileges, and a 'Gildhalla Trutonicorum' was estab. in London by Rhineland merchants, under Henry II. The rent of this guildhall (two shillings per annum) was remitted by Richard Cœur de Lion as an acknowledgement of the reception given him at Cologne on his way home from captivity. While the Cologners thus prospered in England, other Gers. were busy elsewhere. Early in the fifteenth century Wisby (in Gothland) was the centre of a mercantile association which monopolised the Baltic trade, and extended its operations eastward to Novgorod and westward to England. In 1241 Hamburg and Lübeck formed a league to protect themselves against pirates, robber barons, and the tolls and exactions of feudal nobles. They were joined by other cities, and the H. L. (*Hansa*, a defensive alliance) soon absorbed the Wisby association, and not only became paramount in the Baltic, but rivalled the Cologners in England, obtaining from Henry III. permission to found a new settlement in London. After some years of contention the rivals amalgamated, and their Stahlhof, or Steel-yard, became the centre of London's commerce, the Cologners retaining the chief interest. In Germany the league made Lübeck its cap. city; all disputes were referred thither, and from 1280 onward a diet was held there every third year. About eighty-five cities joined the Hansa, and were arranged in four dists., with Lübeck, Cologne, Brunswick, and Danzig as their centres. There were four great 'factories' at London, Bruges, Bergen, and Novgorod, of which Bergen was said to be more Ger. than Norwegian, Bruges more Hanso than the Hanse tns., and in London the Gildhalla, lending money to Edward III. and other kings, received from them valuable privileges and monopolies which led to serious quarrels with Eng. merchants, especially as the latter had no corresponding advantages abroad. About the time of Henry VII. the league export of Eng. cloth was forty times greater than that sent out in Eng. ships. During the fourteenth and fifteenth centuries, the Hansa, though never formally recognised by the empire, was stronger than most of the rulers with whom it had dealings. It had its own financial system and courts of justice, enforcing its decrees by fines, and if necessary, by war. Strict discipline was maintained among its members, any recalcitrant city being liable to exclusion. Some monarchs who defied it were overwhelmed; for example, Walde-

mar of Denmark (1369). But sov. causes gradually tended to weaken its power; the discoveries of Columbus and Vasco do Gama diverted the course of trade, the Baltic fishery declined, and political changes in Germany made princes stronger and cities weaker. The Dutch after a hard fight secured much of the Baltic and North Sea trade, and S. Germany competed for inland commerce, while the London monopoly was abolished by Elizabeth in 1598. A disastrous war against Scandinavia broke the power of the league, and in the seventeenth century it was finally dissolved.

Hansi, tn. in the Hissár dist. of the Punjab, India, 82 m. N. of Delhi. Pop. 16,000.

Hansom, Joseph Aloisius (1803-82), Eng. architect and inventor, was the son of a joiner, to which trade he himself was at first apprenticed. Showing an aptitude for design, he became assistant to a York architect; afterwards he entered the profession himself and designed many important buildings, chiefly Rom. Catholic churches. The Birmingham tn. hall is his work. His name is remembered as the inventor of the patent safety cab, for which he received only £300.

Hansom Cab, see CABs.

Hansson, Ola (1860-1925), Swedish author, b. at Honsings in S. Sweden. His work includes some excellent criticisms: *Der Materialismus in der Literatur* (1892), and *Scher und Deuter* (1894); he also wrote *Friedrich Nietzsche* (1890); *Fru Ester Bruce* (a novel, 1893); *Amors Hären* (1894); and *Ung Ofega Fisorn*, which was trans. into Eng. by George Egerton, 1895.

Hansteen, Christopher (1784-1873), Norwegian astronomer, b. at Christiania (Oslo). He is noted for his researches in connection with terrestrial magnetism, and in 1816 he was appointed to the chair of astronomy and applied mathematics at the Christiania Univ. His first pub. on the subject was in 1819, and was trans. into Ger. by P. T. Hansson with the title *Untersuchungen über den Magnetismus der Erde*. Later he was made director of a new observatory that had been built at Christiania (1833), and to which he had a magnetic observatory added in 1839. In 1837 he carried out the survey of Norway.

Hanthawadi, or **Hanthawaddy**, dist. in Lower Burma in Pegu div.; forms part of the valley of the Rangoon R. There are important oil refineries at Syriam. Rice is the chief product of the region. The cap. is Rangoon. Pop. 492,000.

Hants, see HAMPSHIRE.

Hanumān, see ENTELLUS MONKEY.

Hanumān (having large jaws), in Hindu mythology, the monkey-king, conspicuous figure in the epic *Ramayana*. He is sometimes called son of Pavana (god of the winds), and was said to have colonised much of the Deccan with his followers. The Sanskrit drama *Hanumannadaka* (tenth or eleventh century) deals with his adventures.

Hanway, Jonas (1712-86), Eng. philanthropist, amassed, as a merchant, a considerable fortune, during the acquisition of

which he travelled extensively in Russia and Persia. At the age of thirty-eight he retired from trade, settled in London, and pub. an account of his travels (1753). He now interested himself in social questions, and as a reward for his efforts in this direction he was, in 1762, appointed commissioner of the victualling office. In 1756 he, with the co-operation of Sir John Fielding and others, founded the Marine Society, which was of great use in attracting recruits for the navy. Two years later he became a governor of the Foundling Hospital, and in the same year was instrumental in instituting the Magdalen hospital. He is said to have been the first Londoner habitually to carry an umbrella. Two years after his death a monument was erected to his memory in Westminster Abbey. There is a biography by John Pugh (1787, 1798).

Hanwell, par. in Middlesex, 7 m. W. of Paddington. H. asylum, which serves for the co. of Middlesex, is in the adjoining par. of Norwood. In the cemetery of St. Mary's church is buried Jonas Hanway (q.v.). In pre-Norman times the manor of H. belonged to Westminster Abbey. Pop. 25,000.

Hanyang, city in China, in the prov. of Hupeh, on the r. b. of the Huan R., opposite Hankow. It formerly had an arsenal, steel works, and glass factories, besides a smokeless powder factory. With Wuchang it is virtually a suburb of Hankow. Pop. (1936) 100,000.

Haparanda (Aspen coast), seaport tn. in Sweden in the prov. of Pitea, on the N. shore of the gulf of Bothnia. Opposite is the Russian tn. Tornæa. It has considerable trade, and has a meteorological station. Pop. 2600.

Hapsburg, or **Habsburg**, former imperial house of Austria-Hungary, called from the ancestral castle on the Aar in the Swiss canton of Aargau, built in the eleventh century by Bishop Werner. At a later period the owners of H. became counts of H., and by degrees extended their ter. The first distinguished member of the race was Count Albert IV., whose son, Rudolph, became emperor in 1273, and it is to this line that the historical celebrity of the house is almost entirely due. Rudolph, Ger. emperor, or holy Rom. emperor, was founder of the house that ruled as dukes of Austria, and after 1439 the Hapsburgs of Austria, up to and including Charles VI., was also always holy Rom. emperor. On the death of Charles VI. in 1740 his daughter, Maria Theresa, who succeeded him, married Francis Stephen of Lorraine, chosen Ger. emperor in 1745, and the house of Hapsburg-Lorraine continued to provide emperors till 1806 when, with the estab. of the new empire, the title of holy Rom. emperor was changed for that of emperor of Austria. A Sp. dynasty was also descended from the Emperor Rudolph beginning with the Emperor Charles V., who united Spain to the H. dominions, but in 1558 it was again placed under a separate ruler, and a further attempt to place a H. on the Sp. throne after the death of Charles II. in 1700 met with no success. The H. dynasty came to an end

after the First World War. The faint hope of restoring the ex-Empress Zita's son, the Archduke Otto, to the throne of Austria vanished after the Austro-Ger. agreement of 1936. See also **AUSTRIA-HUNGARY**, **FRANCIS JOSEPH**, and **FRANCIS FERDINAND**, and **HOLY ROMAN EMPIRE**. See E. M. Fürst von Lichnowsky, *Geschichte des Hauses Habsburg*, 1836-41; E. von Glaise-Horstenau, *The Collapse of the Austro-Hungarian Empire*, 1930; and A. J. P. Taylor *The Habsburg Monarchy*, 1941, 1948.

Hapur, tn. of India, 20 m. S. of Moerut, has considerable local trade in sugar, grain, cotton, and brass vessels. Pop. 20,000.

Hara, **Takashi** (1856-1921), Jap. statesman; b. at Morloka. Studied law; but embraced journalism, to which he returned sev. times in his career. In 1886, chargé d'affaires, Paris. Minister, Korea, 1896-97. Minister of communications, 1900-1. Representative of Morloka in Parliament from 1902. Sev. times minister for home affairs. Visited America and Europe, 1908. Became premier of Liberal gov., Sept. 1918. He was assassinated by stabbing at Central railway station, Tokyo.

Harafurias, see **ALFCRAS**.

Hara-kiri, method of suicide which became customary among the Jap. nobility during the Middle Ages. About five centuries ago it was recognised as a national institution, and was either voluntary or obligatory. A Samurai leader might choose this death rather than allow himself to be captured or disgraced; or he might receive an intimation from court that he had incurred the death penalty for some offence, but was permitted to avoid the indignity of a public execution by disembowelling himself with the dagger which accompanied the message. Obligatory H. was abolished in 1868.

Harald, see **HAROLD III.**

Haram, see **HAREM**.

Harar, see **HARRAR**.

Harbin, tn. in Manchuria, on the Sungari R., 323 m. N.E. of Mukden. It is situated at an important junction of the Siberian railway, since the construction of which it made great progress. It has flour mills and breweries. Pop. about 660,000.

Harbledown, par. and vil. in Kent, 1 m. W. of Canterbury, was a well-known resting-place for Canterbury pilgrims. It contains an almshouse, formerly a hospital founded by Lanfranc for lepers, and close by is the old church of St. Nicholas. Pop. 1000.

Harborough, see **MARKEH HARBOROUGH**.

Harbour (Middle Eng. *herberue*, from *here*, an army; and *beorg*, shelter; same derivation as Fr. *auberge*, an inn), sheet of water, protected from the action of wind, etc., on the waves, and designed for the protection of ships. All H.s. may be classified either as havens for the protection of ships in storms, or as ports for commercial purposes; according to another classification all H.s. are either natural or artificial.

Natural Harbours, as their name implies,

are those Hs. which are sufficiently protected by their situation, without needing any artificial aid. In determining the value of such Hs., the geological and other physical peculiarities of the shore; the strength, direction, and range of tides; the depth of water in the protected area; the angle at which the heaviest waves impinge on the coast-line; the slope of the foreshore; and the width and shape of the entrance, must all be taken into account. Among the natural Hs. it is only possible to mention a few typical instances: Sydney H. extends 13 m. inland, with a coastline of 188 m.

named Venice, Poole, Wexford, and those at the mouths of various rvs.; in many cases works have been carried out to prevent deterioration and increase the depth, when the Hs. more properly come into the category of artificial Hs.

Artificial Harbours are those in which the natural resources of the coast are supplemented by breakwaters. Generally a H. is formed where shelter is provided to a certain extent by the natural configuration of the land, but requires to be made complete by one or more breakwaters. Where the exposure is from one direction only, and some shelter is given by a projecting



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A NATURAL HARBOUR: SYDNEY, NEW SOUTH WALES

and an area of 21 sq. m.; geologically it is a 'drowned valley,' the depth of water ranging from 30 ft. at the wharves to 80 ft. at the heads; the bay of Rio de Janeiro is one of the largest natural Hs. of the world, being 15 m. in length, from 2 m. to 7 m. in width, protected by headlands on either side, and having an entrance almost 1 m. in width; New York H. is protected by Long Is., as Southampton Water is sheltered by the Isle of Wight, both being very good Hs.; Milford Haven ('haven' having the same significance as 'harbour') has a minimum depth of eight fathoms, and combines facility of entrance with perfect security. At various places there are large enclosed areas which have openings to the sea, but these are as a rule very shallow, save in the main channels, and access is as a rule rendered difficult by the bar which forms at the mouth, where the ocean checks the outgoing current of the rv. Among such Hs. may be

headland, one breakwater at right angles to the shore, curving inwards slightly at its extremities, may be sufficient, as is seen at Newhaven. As a rule some abrupt projection from the coast is utilised to provide shelter from one quarter, and breakwaters enclosing the site complete the protection, as at Colombo. Naval Hs., which are required by maritime powers as stations for their fleets, and dockyards for the construction and repair of ships, generally come within the class of artificial Hs. The Dover H. is purely artificial, for instance, the length of the breakwaters being over 2 m. The Takoradi H., on the Gold Coast, built since the First World War, is a good instance of engineering triumphing over difficulties, though all precautions have to be taken to prevent sitting up at the entrance. See also AROMANCHES, HARBOUR OF.

Harbours of Refuge.—All Hs. can of course be used as Hs. of refuge when a ship

is in need of shelter, but some Hs. are built more for the purpose of protection than for anything else. A refuge H. is occasionally constructed where a long expanse of stormy coast, which is near some route of ships, is without any natural shelter. In such cases breakwaters are carried out from the shore at a considerable distance apart, and converge to a central entrance of suitable width to form the required shelter. Easy approach and a safe entrance, combined with good anchorage, are requisite for a H. of refuge.

Commercial Harbours are those designed primarily for commercial uses. On important trade routes commercial Hs. must be provided for the formation of ports within their shelter, or for the protection from the sea of the approaches of ports near the sea coast, or on large rvs. A greater latitude may be observed in the selection of a site for a H. of refuge or for a naval H. than for a commercial H. The docks of a commercial H. keep the water at the same level for the discharge of cargo, etc. A good commercial H. should have an ample supply of machines for the removal and transport of goods, plenty of quay space, good warehouse accommodation, and navigation aids. By radar aid vessels, suitably equipped, may be brought into harbour in dense fog, and loud-hallers, with a considerable range, may be used to give instructions.

Situation of Harbours, etc.—When the exposure of the H. is great, as when it is situated on a regular coastline, it is essential that there should be either a considerable internal area, or a separate basin opposite the entrance to the inner basin, for the waves to spend their force. If possible such a basin should enclose a portion of the original shore for the waves to break upon; if this is impossible there should be a flat talus wall of a slope of at least 3 or 4 to 1. The same points which determine the value of a natural H. (*see above*) must be studied in the case of an outer H., the direction of the entrance in relation to the line of maximum exposure, etc. Thomas Stevenson drew up a formula for determining the reduction produced in the enclosed area of waves at any given distance not exceeding 50 ft. from the entrance:

$$x = H \frac{\sqrt{b}}{\sqrt{B}} - \frac{1}{50} (H + H \frac{\sqrt{b}}{\sqrt{B}}) \sqrt{D}$$

H = height of wave at entrance; *b* = breadth of entrance; *B* = breadth of H. at place of observation; *D* = distance from mouth of H. to place of observation; *x* = height of reduced wave at place of observation; all in feet. If *H* is said to be equal to unity, then *x* equals a fraction representing the reductive power of the H.

In order to render tranquil Hs. of small reductive power, logs of timber called booms are used. Their heavy ends are secured by projecting into grooves cut in each side in the masonry; and they are warped down or fixed with an iron hasp at the coping course, in order to prevent the swell entering the H. from underneath. Thus a temporary wall is formed which

checks the waves and prevents them from spreading into the interior basin. For further particulars on various points see PIER; BREAKWATER; DOCKS; COAST PROTECTION. See also 'Researches in Hydrodynamics,' *Transactions Royal Society of Edinburgh*, xiv., 1837; Sir J. Rennie, *Theory of the Formation and Construction of British and Foreign Harbours*, 1854; T. Stevenson, *Design and Construction of Harbours*, 1874; B. Cunningham, *Dock and Harbour Engineers' Reference Book*, 1923, and *Harbour Engineering*, 1928; E. C. Shankland, *Modern Harbours Conservancy and Operations*, 1926, and *The Dredging of Harbours and Rivers*, 1931.

Harbour Grace, port of entry and second most important tn. in Newfoundland, is situated W. of Conception Bay and 26 m. S. by W. of St. John's, with which it is connected by rlv. It does considerable trade in furs, fish, seal-skins, and cod-oil. Pop. 2500.

Harbours, Prefabricated, see under ARROMANCHES, HARBOUR OF.

Harburg, seaport in the prov. of Hanover, Germany, situated on the Elbe, 6 m. S. of Hamburg. Before the Second World War it did considerable trade in gutta-percha, linseed, and coconut oil, jute, chemicals, etc. The tn. was a favourite holiday resort, one of its chief attractions being a castle on the rlv. Pop. (with Wilhelmsburg) 105,000.

Harcourt, Lewis Vernon Harcourt, first Viscount (1863-1922), Eng. politician, b. in London, eldest son of Sir Wm. V. Harcourt (q.v.) by his first marriage; educated at Eton. He acted for many years as his father's private secretary during his tenure of the offices of home secretary and chancellor of the Exchequer, and was closely connected with the organisation of the Liberal party during its period of opposition from 1895. In 1904 he was elected as Liberal member for N.E. Lancashire (Rossendale), which seat he retained by large majorities. In Sir H. Campbell-Bannerman's first ministry, 1905-6, he was first commissioner of works; and he entered the Cabinet still holding that office, in 1907; he retained it in Asquith's first Cabinet, 1908, and in 1910, and then was promoted to the secretaryship of state for the colonies. He was first commissioner of works again, 1915-1916; raised to the peerage, Jan. 1917. He was a keen opponent of woman's suffrage.

Harcourt, Sir William George Granville Venables Vernon (1827-1904), Eng. statesman, b. at York; after a distinguished career at Trinity College, Cambridge, was entered at Lincoln's Inn in 1851, and three years later was called to the Bar. He soon was in the enjoyment of an extensive practice, and made a name for himself at the bar. Bar, the most lucrative branch of the profession. He had early begun to write for the *Morning Chronicle*, and was one of the original staff of the *Saturday Review*. He wrote, generally on international law, as 'Historicus' in *The Times*. He took silk in 1866, and was appointed Whewell prof. of international law at Cambridge, which position he held from 1869 until

1887. As what may be called an Independent Liberal, he entered Parliament in 1868. Five years later he became solicitor-general in Gladstone's administration, and was knighted. In the following year Disraeli came into office, and H. was in opposition. When Gladstone returned to office H. became home secretary. In 1886 he became chancellor of the Exchequer, and was looked upon as having the reversion to the leadership of the party. When Gladstone retired in 1894, H. expected to be his successor, but to the general surprise the queen sent for Lord Rosebery, under whom H. generously consented to serve. In that year he introduced his famous death-duties budget, which, although fiercely contested at the time, marked a new era in the country's financial policy. In the following year the gov. was defeated. In Dec. 1898, owing to want of support in the party, he resigned the leadership. He was a brilliant speaker, an excellent leader, and a most popular man.

Harda, tn. in the dist. of Hoshangabad, India, 64 m. S.S.W. of Bhopal. Pop 13,500.

Hardaonut, see HARDICANUTE.



Norwegian State Railways

VÖRINGFOSS WATERFALL, HARDANGER DISTRICT, WEST NORWAY

Hardanger Fjord, inlet, 68 m. long, on the S.W. coast of Norway in the prov. of Bergen; its greatest breadth is 3 m., but some of its branches are considerably narrower. The H. Fjord stretches away to the N.E., and the scenery throughout the whole length of the fjord is magnificent, including many cataracts like the Voringfoss. The many islets and peninsulas divide the opening into various branches as the Sørfjord, Osefjord, Åkrafjord,

Graverfjord, and Maurangerfjord. See also NORWAY.

Harden, Maximilian (1861-1927), Ger. journalist; b. in Berlin. In 1892 he founded the weekly *Die Zukunft*, which ran for thirty years. During the First World War he pub. some daring articles in this periodical, notably one eulogising the Brit. effort in the Gallipoli campaign (trans. in *Foreign Opinion*, 1915). Through H.'s attack on court corruption Prince Eulenburg had to leave the country, 1907. During the First World War articles by H. had worldwide fame. Wrote *My Contemporaries*, 1926.

Harden, see HAWARDIN.

Hardenberg, Georg Philipp Friedrich von, see NOVALIS.

Hardenberg, Karl August, Prince von (1750-1822), Prussian statesman, in the service of Hanover and Brunswick, 1770-1790. In 1791 he became a Prussian minister of state under Frederick William II., helping to conclude peace between Prussia and the Fr. republic at the conference of Basel, 1793. Under Frederick William III. he became Prime Minister, 1803. At home he aimed at developing Prussia by various economic measures, abolishing serfdom, and improving the condition of the peasants generally, and providing for educational reforms and trade. His foreign policy was to oppose Napoleon, and he allied with Russia (1805), but was soon driven from power by Haugwitz (1806). In 1810 he succeeded Stein as chancellor, and carried on the latter's reforms. H. took part in the war of liberation, and signed the first treaty of Paris (1814). He was plenipotentiary at the congress of Vienna (1815), and became president of the State Council (1817). See C. Klose, *Leben C. A. Fürsten von Hardenberg*, 1851; *Memoirs* (ed. by L. Ranko), 1877; Cambridge Modern History, ix. 1907; E. von Meyer, *Die Reform der Verwaltungsorganisation unter Stein und Hardenberg*, 1912; and life by H. von Richthofen, 1933.

Hardenberg: 1. Small tn. in the Netherlands, situated on the R. Vecht, in the prov. of Overijssel. 2. Com. of the Rhineland, Germany, 8 m. E. of Düsseldorf, with manuf. of textiles, machinery, etc. Pop. 12,000.

Harderwijk, seaport of the Netherlands, situated in the prov. of Gelderland, on the S.E. shore of the IJssel Meer (Zuyder Zee), 31 m. E. of Amsterdam. It was a Hanseatic tn., and from 1648 to 1811 the seat of a univ. Herring-curing is the chief industry, with exports of wood and cereals. Ger resistance in N. Holland collapsed before the Canadian Army in April 1945, the whole area, apart from a small tip in the N.E., being cleared as far S. as H., on the E. shore of the IJssel Meer by April 21. Pop. about 8500.

Hardhead (N. Amer. fish), see MENHADEN.

Hardicanute, or Harthaenut (c. 1019-42), son of Canute, king of England, and Emma of Normandy. On the death of his father the Eng. Crown was contested by his half-brother, Harold. The Queen Emma and Earl Godwin supported H., and Earl

Leofric assisted Harold. The Witan met at Oxford, and decided that Harold should rule as regent in England and H. remain in Denmark. This was not agreed to, and H. joined Queen Emma and attacked Harold. Harold was elected king, and the queen was driven out. While H. was collecting another army Harold d., and H. peacefully succeeded. His reign was cruel and oppressive. He burnt the city of Worcester for rebelling against an excessive tax. While present at a marriage feast he was seized with a fit and d. a few days later.

Hardie, James Keir (1856-1915), Scottish miner, journalist, and politician. B. of working-class parents in Ayrshire, he had no schooling, but learned to read at home. At eight years old he was doing odd jobs, and at ten was working in a pit. He became honorary secretary of the newly formed Ayrshire Miners' Union, in which he was associated with Andrew Fisher, who became Prime Minister of the Australian Commonwealth. For this he was blacklisted, which fact turned him into an agitator, and he devoted his life thenceforth to persuading his class to work out their own social salvation. In 1900 was returned as Socialist and Labour member for Merthyr-Tydfil, and retained his seat with increased majorities in three subsequent elections. In 1892 he founded, with others, the Independent Labour party (I.L.P.) (q.v.), and was the first chairman of the Parl. Labour party. Was editor of the *Cumnock News* from 1882 to 1886, and the following year founded and ed. the *Miner*, afterwards the *Labour Leader*. Wrote considerably on Socialism and Labour topics, including a book on India, which he visited during a world-tour for health reasons in 1907-8. See life by W. Stewart, 1921.

Harding, Warren Gamaliel (1865-1923), twenty-ninth President of U.S.A., b. at Corsica, Morrow co., Ohio; eldest of eight children of George Tyrone H., a physician of Scottish descent. He received some education at Iberia, Ohio; but frequently as a boy had to work as farm hand and teamster. In 1884, employed on the *Marion Mirror* weekly, whose proprietor afterwards enabled him to start the *Marion Star*, by which he made himself known. Elected as a Republican to the State Senate in 1898; Lieutenant-governor of Ohio in 1903. A candidate for governorship in 1910. In 1914 he was elected U.S. senator. He supported the policy of President Wilson during the First World War; but was among those who strongly disapproved of Wilson's post-war policy—especially in connection with the League of Nations. On Nov. 2, 1920, he was elected by the Republicans as president by an enormous majority, as against Governor Cox of Ohio. Although opposed to the League, H. favoured an international court of justice. During his term the Conference for Limitation of Armament was held in Washington 1921-1922. In the summer of 1923 he visited Alaska, and on his return lay ill with pneumonia for a week, at San Francisco, California, where he unexpectedly d. of apoplexy, Aug. 2.

Hardinge, Henry, first Viscount Hardinge of Lahore (1785-1856), Brit. general, was b. at Wrotham in Kent. After being gazetted as ensign, he was in active service in the Peninsular war. From 1809 to 1813 he was connected with the Portuguese Army, and was then appointed commissioner at the Prussian headquarters by Wellington, but being wounded at Ligny was unable to fight at Waterloo. After being secretary for war in 1828, secretary for Ireland in 1830, he became governor-general of India in 1844 at the time of the Sutlej campaign against the Sikhs, but in his capacity as a soldier he took the position of second-in-command to Sir H. Gough. After the peace of Lahore he was made a viscount, and in 1852 succeeded Wellington as commander-in-chief, being made a field-marshal in 1855.

Hardinge of Penshurst, Charles, first Baron (1858-1944), Eng. diplomatist and viceroy of India, second son of the second Viscount H., and grandson of first Viscount II. (see article above). Educated at Harrow and Trinity College, Cambridge, and began his career in the diplomatic service in 1880. Received appointments at Tcheran and St. Petersburg, becoming Brit. ambas. at the latter place in 1901. His position here was rendered difficult by war between Russia and Japan, but his influence helped to ease the tension, which had become still greater by reason of the Dogger Bank incident. Did valuable work in laying the foundations of the Anglo-Russian agreement of 1907, having, when that instrument was signed, become permanent under-secretary of state. He was viceroy of India from 1910 to 1916. It was in his term that the cap. was moved to Delhi, and the partition of Bengal, enacted by Curzon, revised. But it was a period of much unrest, and in 1912 an attempt was made upon his life when he was severely wounded by a bomb. Lady H., though unscathed, dying later from shock in 1914. H., however, persisted in his policy of friendly relations with the Indian princes, and sympathy with the new W. educated middle classes, as well as with the needs of the masses, notably in the way of provision of public works, sanitation, and education. In response to his appeal, after war had broken out in 1914, the Defence of India Act was passed in 1915, though some of its provisions were opposed by Indian legislators; but £100,000,000 was cordially voted as India's contribution to imperial war funds. It was in his term that a Mohammedan univ. was estab. at Aligarh and a Hindu at Benares. Hist. will remember H. as a devoted friend to the people of India. Returned, under Balfour, to the Foreign Office, but had to bear his share of responsibility for the fall of Kut, for the findings of the commission of inquiry included the ex-viceroy as well as the secretary of state for India in their sweeping censure. Austen Chamberlain at once resigned, but H.'s resignation was not accepted by Balfour and, in 1920, he succeeded Lord Derby as ambas. in Paris, unexpectedly resigning in 1922, probably through the strain of his term as viceroy. His temperament

was too reserved to seek popularity; but he had sound judgment, great determination, and industry, and a thorough knowledge of official affairs.

Hard Labour, see PRISONS AND PUNISHMENT.

Hardness, Scale of, in mineralogy. The H. of a mineral is measured according to its power of scratching other minerals. For this purpose Mohs arranged a series of minerals in definite order of H., to form a standard scale for comparative purposes. Those selected were (1) talc; (2) gypsum; (3) calcite; (4) fluor spar; (5) apatite; (6) orthoclase; (7) quartz; (8) topaz; (9) sapphire; (10) diamond. In this scale each member will scratch all those with lower, and will be scratched by those with higher numbers. The test, which is only approximate, is best made with crystals or fragments having smooth, bright faces; a collection of such pieces of the above minerals forms an important part of a mineralogist's equipment; and by means of it the H. of any unknown specimens may be determined, which would otherwise be undistinguishable except by elaborate chemical tests. Minerals often differ in H. on different faces of their crystals, and the same face may at one time have different degrees of H. in different directions. More refined methods are necessary to detect these differences, and for this purpose the sclerometer, an instrument in which a small point of steel or diamond is drawn across the surface under a definite pressure, is used. Useful tests may be made by quite simple means; thus talc (1) will mark paper or cloth; gypsum (2) is scratched by the finger-nail; calcite (3), fluor spar (4), apatite (5) are cut without difficulty by a steel knife; orthoclase (6) can just be scratched, and quartz (7) is harder than steel. Minerals which have a H. above (6), and cannot be scratched with a splinter of quartz, are rare, and are generally precious stones.

Hardoī, chief tn. of a dist. of the same name in the United Prov., India. It is situated about 60 m. N.W. of Lucknow. It has salt-petro works and grain is grown and exported. The dist. is watered by sev. rvs., including the Ganges, Gavîa, Gumti, and Rainganga; there are also a number of lakes. Area of dist. 2323 sq. m. Pop. 1,239,279. Pop. of tn. 53,100.

Hard Speler, see SPLETER.

Hardwar, Hurdwar, or Haridwari, tn. in the dist. of Saharanpur, United Provs., India. It stands on the r. b. of the Ganges, and is visited every year by a large number of pilgrims, owing to its sacred position. Sometimes there are as many as 300,000, especially when, every twelfth year, a greater festival is held. Pop. 31,000.

Hardwicke, Sir Cedric Webster (b. 1893), Eng. actor, b. at Lye, Worcestershire. Educated at Bridgnorth and Academy of Dramatic Art. First appearance, Lyceum, 1912. In Benson's company, 1913. In Shakespearian plays at the Old Vic, 1914. Served in France, 1914-18. In Birmingham Repertory Company, 1922. Played at Malvern festivals, including prominent roles in Shaw's plays, and in the *Barretts of Wimpole Street*, 1934. His

later films include *Peg of Old Drury*, *Things to Come*, *Tudor Rose*, *Laburnum Grove*, *The Moon is Down*, and *Nicholas Nickleby*. Redes Lecturer at Cambridge, 1936. Among his pubs. is *Let's Pretend: Recollections and Reflections of a Lucky Actor* (1932).

Hardwicke, Philip Yorke, first Earl of (1690-1764), Eng. lawyer and lord chancellor, was b. at Dover. After spending some time in the office of a London solicitor, he was called to the Bar in 1715. In 1719 he became a member of Parliament and in the following year was made solicitor-general and knighted. In 1732 he became lord chief justice, and four years later lord chancellor. In 1740 H. assisted in the government of the country during the absence of the sovereign, and was also instrumental in settling affairs after the Jacobite rebellion in 1745. He was created Viscount Royston and earl of H. in 1754.

Hardwood Trees, deciduous trees, as distinguished from evergreens (pines, firs, etc.). The name is especially applied to the oak and the ash and other trees of slow growth. In Australia the name is given to trees with timber like teak (*Backhousia Baucifolia*). The W. Indian shrub *Ixora ferrea* is another example. Ebony, walnut, maple, sycamore, and beech are also H. T.

Hardy, Alexandre (c. 1569-c. 1631), Fr. dramatist, was b. in Paris. He was connected for some time with a travelling company of actors, and wrote plays for them. His plays, which he obtained mainly from Sp. and It. sources, numbered probably about 600—the best being *Mari-anne* (1610). See E. Rigal, *Alexandre Hardy et le théâtre français à la fin du XVII^e et au commencement du XVIII^e siècle*, 1889.

Hardy, Sir Charles (1716-80), Eng. admiral, entered the navy about 1730. In 1744 he was charged with the loss of a convoy to Newfoundland, but was eventually acquitted. In 1755 he was made governor of New York, and took part in the siege of Louisburg. In 1759 he was in command under Hawke at Quiberon Bay, and was made an admiral in 1770. He was appointed to be governor of Greenwich Hospital in 1771, and was given the command of the Channel Fleet in 1779.

Hardy, Thomas (1840-1928), Eng. novelist and poet, b. at Upper Beckhampton, near Dorchester. His father was a stonemason, and his mother came of a family which had owned some small landed property in Dorsetshire for many generations. H.'s branch of the family was in modest but tolerably comfortable circumstances, and it is claimed that it was connected with Sir Thomas H. Nelson's flag-captain (whom he is said to have resembled in features), also with the T. H. who founded the Dorchester grammar school in the sixteenth century, and also with John Le H. of Jersey who settled in the W. of England. H., who as a boy was of a studious nature, was educated at a local school, and received private tuition in Lat. and Fr. His

father wished him to follow the profession of an architect, and accordingly he was articled to John Hicks, an ecclesiastical architect in Dorchester, and later with Sir Arthur Blomfield in London. It is easy to trace in his novels his familiarity with this study, notably in the novel *A Pair of Blue Eyes* (1873), in which he makes use of the knowledge of old churches he acquired under Blomfield when the latter was engaged in restoration work. It has been asserted that he was not greatly enamoured of the vocation, but was fonder of music and drama, but it is significant of



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THOMAS HARDY
Pencil drawing by W Strang

his powers that after less than six years' study he became prizeman of the Royal Institute of British Architects and of the Architects' Association. His special bent, however, was towards writing, and, in particular, towards poetry, and when ultimately he embraced writing as a calling he did so with a confidence and sureness which may perhaps be regarded as natural in one who became the greatest man of letters of his time. His first published effort was a quaintly humorous article entitled 'How I Built Myself a House,' which appeared in *Chambers's Journal*, March 1865. At this time he was attending evening classes in King's College to complete the academic side of his education, and there he studied eagerly Gk. and Lat., theology, literature, and even astronomy. H., if great as a born novelist, was in a sense a novelist *mâitre lui*. His earlier and later passion was poetry, and as a poet he revealed a truly original genius—the poems, generally speaking, being the novels in epitome. His literary career

began with verse, but there is not much of his early verse extant, probably for the good reason that he held it back for later development. It was with reluctance that he gave up poetry for the time being and turned to novel writing for a living. In 1871 appeared *Desperate Remedies*, which shows considerable maturity for an author of thirty one years of age, possibly because a certain amount of destroyed fiction had preceded it, and in 1872 *Under the Greenwood Tree*. In 1873 came *A Pair of Blue Eyes*, which first appeared in *Tinsley's Magazine*, and this was followed by a request from Frederick Greenwood, editor of the *Cornhill*, to write a story for that periodical. The *Cornhill* tale was the masterpiece *Far from the Madding Crowd* (pub as a novel in 1874), which first reveals in ample measure the wonderful sense of the Wessex countryside which H. possessed and his grasp of artistic unity—a grasp preserved throughout the mazes of essentially intricate and baffling plots. In 1876 appeared his one long comedy, *The Hand of Ethelberta*, the one novel with an approximation to the conventional happy ending, and for this reason not one of his best. In that year H. married his first wife, Emma Lavinia Gifford, niece of Dr Gifford, archdeacon of London. This lady died in 1912, and we may accept it that the beautiful character Elfrida in *A Pair of Blue Eyes* (1873) is his literary tribute to her memory, and that the 'Poems of 1912–1913' in *Satires of Circumstances* reflect the poignancy of his grief. In 1878 was pub *The Return of the Native*, than which no greater Eng rural novel has been written, the characters in it, albeit rounded and convincing, are yet merged in the still greater portrayal of the milieu, 'Egdon Heath,' which, as has been well said, is the real 'hero' of the story. This novel, too, marks an obvious advance in range of ideas and philosophic depth, and it securely laid the foundation of the impressive array of novels which followed it. The striving—and successful striving—after artistic unity and coherence is manifest from H.'s own classification of his novels into 'Novels of Ingenuity' (*Desperate Remedies*, *The Hand of Ethelberta*, and *A Laodicean* (1881)), 'Romances and Fantasies' (*A Pair of Blue Eyes*, *The Trumpet Major* (1880), *Two on a Tower* (1882), *The Well-Beloved*, and *A Group of Noble Dames* (short stories, 1891)), 'Novels of Character and Environment,' containing all the remaining novels and short stories and among them all his best work, *Far from the Madding Crowd*, *The Return of the Native*, *The Mayor of Casterbridge* (1886); *The Woodlanders* (1887); *Tess of the D'Urbervilles*, and *Jude the Obscure* (1895); together with *Under the Greenwood Tree* and 2 vols. of short stories entitled *Wessex Tales* (1888), and *Life's Little Ironies* (1913) and to these may be added the collection entitled *A Changed Man* (1913), somewhat vaguely classified in a fourth category, 'Mixed Novels,' to which none other was added. It need hardly be said that romance characterises many novels besides those so classified; while environment and characterisation are

strong features of most of them. In deed, all of them may quite well receive the title 'Wessex Tales,' and are indeed commonly classified as the Wessex Novels; a description which most appeals to the reader by reason of the wealth of local colour in them. H.'s treatment of natural features is never irrelevant; it is integrally a part of the story, and the characters seem to spring from the topography with the inevitability of the development of the plot. *Tess of the D'Urbervilles*, his most popular novel, was written as a serial for the *Graphic*. In it his negative philosophy of the irony of fate is most powerfully and dramatically revealed. This irony is the keynote of the whole of his work, and doubtless sprang partly from H.'s deep sense of compassion for all creatures, human or otherwise. H. is almost obsessed with the insoluble problem of the cruelty of nature, and this recurrent theme is the framework into which all his great prose tragedies are built. Apart from the Schopenhauerian tenets implicit in *The Dynasts* and H.'s claim to the idea of Impenitence becoming perciplent (or, in his words, the idea that 'the Unconscious Will of the Universe is growing aware of Itself'), there is next to nothing constructive in the philosophy of H., and perhaps the effect of his negative treatment is enhanced by the fact that he makes no attempt to suggest any way out for the victims of fate's satire. In the portrayal of women H. is supreme, or at all events highly individualistic. No author can show so striking a gallery of female characters, all memorable and distinctive, and nearly all poignantly doomed with the necessity of tragedy. It has often been said that H. is a pessimist, but to this charge he himself replied that 'he was a pessimist in so far as that character applies to a man who looks at the worst contingencies as well as the best in the human condition.' His most criticised novel was his last, *Jude the Obscure*, which an un discerning and unprogressive critic lampooned as 'Jude the Obscene.' Judged by modern standards of 'frankness,' the novel is of Victorian sobriety; but it has been supposed that the attacks on this grim study 'cured him of his interest in novel-writing,' and *The Well-Beloved*, the last novel to be pub., was merely the revised version of a story written some years previously. It is more probable that he was only too glad to find an excuse for returning to poetry. In this direction it was imagined that at his age he must have 'shot his bolt,' yet at the age of sixty-four he startled the literary world with *The Dynasts* (1904), an extraordinary revelation of undimmed intellectual powers. This epic drama, conceived on the grand scale, is an interpretation of the national genius of England in its most heroic aspect, and across its stage pass all the political figures of the period, and in its stately verse, H. re-created the tragic splendour and dignity of the Napoleonic wars. It reflects a close study of the metaphysical conception of the indivisible and imminent Will, and the curious will find in the work many lines which closely follow lines

in Schopenhauer's *The World as Will and Idea*. From the time of the production of this work H.'s fame as a poet actually continued to increase. His collected poems up to 1918 are *Wessex Poems of the Past and the Present; Time's Laughing Stocks*; and *Satires of Circumstance*. If there is a sombre note as of grey and mournful evenings running throughout them, it is agreed that H. made a new poetry, whether lyric or dramatic; new in its bitter speech and in its restrained music. He shows a marked sympathy with the Romantic school of Eng. poets, and this is largely to be explained by his deeply romantic sentiment towards children, animals, and nature generally; and in his self-composed memorial verses *Afterwards* we find his feelings and intentions as a romantic poet reaffirmed. Two collections were pub. after 1918, namely *Late Lyrics and Earlier* (1922) and *Human Shows: Far Fantasies; Songs and Trifles* (1925); posthumous vol. of poems *Winter Words* (1928). Among the most striking of his poems are *The Darkling Thrush, On a Fine Morning, At a House in Hampstead, At Lulworth Cove a Century Back, A Singer Asleep* (on Swinburne), *The High School Lawn, To an Unborn Pauper, Childhood among the Ferns, The Tree and the Lady, The Last Chrysanthemum, Afterwards, The Sick Battle-God*, 'There seemed a Strangeness,' *Quid Ille Agis, In Tenebris, Her Death and After, The Alarm, When I set out for Lyonesse, Men who March Away, The Blinded Bird, The Selfsame Song*. His verse tragedy *The Famous Tragedy of the Queen of Cornwall at Tintagel in Lyonesse*, on the eternally new theme of Tristran and Iscuit, was pub. soon after its production at Dorchester in 1923. *Christmas in the Elgin Room*, his last poem, was pub. in *The Times* in 1927. In 1925 he wrote *Life and Art*, his only non-fictional prose work. On his eightieth birthday the representative poets of England under the presidency of Robert Bridges presented him with an address and an album of poems each had written to mark the occasion. H. was awarded the O.M. in 1910, and his other honours of an academic nature were the degrees of D.Litt., Oxford, where he was honorary fellow of Queen's College; Litt.D. of Cambridge, where he was honorary fellow of Magdalene College; and LL.D. of Aberdeen Univ. He resided at 'Max Gate,' a house which was built to his own design and situated outside Dorchester. In 1914 he married Florence Emily Dugdale, who survives him. Mrs. H. has since written a 2-vol. biography which is enriched by entries from H.'s journal and from his letters. He d. on Jan. 11, and his ashes were buried in Westminster Abbey (his heart being buried at Stinsford).

See Annie MacDonell, *Thomas Hardy*, 1894; Sir Bertram C. A. Windle, *The Wessex of Thomas Hardy*, 1901; F. A. Headcock, *Thomas Hardy: Penseur et artiste* (Paris), 1910; L. Abercrombie, *Thomas Hardy: a Critical Study*, 1912 (new ed. 1919); H. Lea, *Thomas Hardy's Wessex* (Illustrated), 1913; H. C. Duffin, *Thomas Hardy*, 1916; H. Child, *Thomas*

Hardy, 1916; H. B. Grimsditch, Character and Environment in the Novels of Thomas Hardy, 1925; P. Braybrooke, Thomas Hardy and his Philosophy, 1927; Florence Emily Hardy, The Early Life of Thomas Hardy, 1840-1891, 1928, and The Later Years of Thomas Hardy, 1892-1928 (2 vols.), 1928, 1930; A. McDowall, Thomas Hardy, a Critical Study, 1931; S. Norman, Thomas Hardy, 1932; Sir A. Strong, Four Studies, 1933; E. A. Baker, The History of the English Novel, 1938; and J. Cecil, Hardy the Novelist, 1943.

Hardy, Sir Thomas Duffus (1804-78), Eng. scholar, b. at Port Royal, Jamaica. In 1861 he became deputy keeper at the New Record Office, and in 1869 acted for the Historical MSS. Commission. In 1848 he was the publisher of the *Monumenta Historica*, and he ed. also many of the Rolls of early times. Among the other works which he ed. are *A Catalogue of the Lords Chancellors, Keepers of the Great Seal, Masters of the Rolls, and Principal Officers of the High Court of Chancery*, (1843); *Descriptive Catalogue of the Materials relating to the History of Great Britain and Ireland to the End of the Reign of Henry VII*, (1862-71); and *The Register of Richard de Kellaway* (1873).

Hardy, Sir Thomas Masterman (1769-1839), Eng. vice-admiral, b. in Dorsetshire. He entered the navy in 1781, and in 1793, after various appointments, was promoted a lieutenant of the *Meleager* frigate, and came under the immediate orders of Capt. Nelson. In 1798 H. joined Nelson near Elba, and was present at the battle of the Nile. In 1803 he was flag-captain of the *Victory* with Nelson, and acted in that capacity in the battle of Trafalgar. H. was with Nelson on the quarter-deck of the *Victory* when he received his mortal wound, and at his funeral in 1806 bore the 'banner of emblems.' H. was created a baronet the same year. He joined the board of admiralty as First Sea Lord in 1830, and in 1837 became a vice-admiral. The last years of his life were spent in peaceful retirement.

Hardyng, John (1378-c. 1465), rhyming chronicler belonging to a N. family, admitted, at the early age of twelve, into the household of Sir Henry Percy (Hotspur), whom he saw fall at the battle of Shrewsbury in 1403. In 1405 he entered the service of Sir Robert Unstrivale, and was made constable of Warkworth Castle. He took part in the battle of Agincourt in 1415, and served the Crown in confidential missions to Scotland. H.'s *Chronicle* treats of the hist. of England from the earliest times down to the flight of Henry VI. from Scotland.

Hare, Augustus John Cuthbert (1834-1903), Eng. author, nephew of the churchmen Augustus Wm. and Julius Charles H., b. in Rome, educated at Harrow and Oxford. His works contain accounts of his travels, especially of the cities of Italy and France. They include *A Winter at Mentone* (1861); *Walks in Rome* (1870); *Wanderings in Spain* (1872); *Days near Rome* (1875); *Cities of North and Central Italy* (1875); *Walks in London* (1877); *Cities of South Italy and Sicily* (1882);

Florence (1884); *South-Eastern France* (1890); *North-Eastern France* (1890); *Sussex* (1894); *North-Western France* (1895); *The Rivieras* (1896). He also wrote *Memorials of a Quiet Life* (1872-76); a biography of his aunt and uncles; *Life and Letters of Maria Edgeworth* (1894); *Story of my Life* (1896-1900); *Story of Two Noble Lives* (1893); and *The Gurneys of Earham* (1895).

Hare, Sir John (1844-1921), Eng. actor and manager, b. May 16, in Yorkshire; son of Thomas Fairs, of London. His first appearance on the stage was at Liverpool, 1864. He came to the Prince of Wales's Theatre, London, 1865; acting under the Bancrofts; and winning a name in many of Robertson's comedies, especially as Lord Ptarmigan in *Society*. He was at the Prince of Wales's for about nine years: appearing in *Caste*, 1867; *School*, 1869; *Money*, 1872; *The School for Scandal*, 1874. H. was manager of the Court Theatre, 1875-79; producing *A Quiet Rubber*, 1876. He was in partnership with Kendal at St. James's Theatre, 1879-88, and they introduced a number of Pinero's plays to the public. The Garrick was built for H. by W. S. Gilbert, and opened 1889 with *The Prodigate*. *A Pair of Spectacles* was produced 1890, Benjamin Goldfinch being one of his most popular roles. H. also played in *A Scrap of Paper*, 1876, 1883; *The Gay Lord Quex*, 1899; *Money* (at the command performance at Drury Lane), 1911. He toured in America, and was knighted in 1907. His last appearance was in 1917 in *A Pair of Spectacles*. See T. E. Pemberton, *John Hare, Comedian*, 1895; and C. W. Scott, *The Drama of Yesterday and To-day*, 1899.

Hare, William, one of the Irish criminal body-snatchers. See under BURKE, WILLIAM.

Hare, name of all rodent quadrupeds of the family Leporidae, except rabbits, the two chief genera being *Lepus* and *Lagomys*. They have long ears and hind legs, very short upturned tails, and a divided upper lip. Hs. construct 'forms,' or shallow nests on the earth's surface in the grass, and do not burrow like rabbits. They are extraordinarily swift in leaping and running, and their colouring, which much resembles their surroundings, is protective. Hs. are solitary and nocturnal in habit, and feed on vegetable substances, grain, roots, and bark of young trees. They are common to most parts except Madagascar and Australasia, but abound chiefly in the N. hemisphere. Where the common *Lepus europaeus* is not found, the smaller *L. timidus* (Alpine or mt. hare) generally replaces it. Two to five leverets are produced sev. times annually. In America the Canadian polar Hs. and the *Lepus americanus* turn practically snow-white in winter. In the W. are to be found a number of long-eared Hs. called jack Hs. Among these are the white-tailed Hs. (*Lepus campestris*) and four species of black-tailed rabbits. See also RABBIT. See E. Coues, *Monograph of the Rodentia*, 1877; E. Thompson, *Wild Animals I have known*, 1898; and F. E. Beddard, *Mammalia*, 1902.

Hare and Hounds, originally a schoolboy pastime in the form of a kind of paper-chase. Two chosen persons, called 'hares,' have about 15 min. start (their 'law') and lay the 'scent' (usually fragments of paper). They are chased by the remainder, called 'hounds,' who have to track out their course. The one who is first to reach the goal wins. Rugby was the cradle of paper-chasing in the early nineteenth century. Since 1877 the game has developed into an organised sport, with recognised rules and clubs. Among noted clubs are the original 'Thames Hare and Hounds,' the S. London, Blackheath, Spartan, Ranelagh, Finchley, Hampton Court, Epsom, Moseley, Highgate, Huddersfield, and Liverpool Harriers, the Essex Beagles, and Oxford and Cambridge Univ. Hare and Hounds. There is a national cross-country championship annually, held in the N., S., or midlands of England.



HAREBELL

Harebell, 'Scotch bluebell,' name now usually applied to the charming perennial wild flower, *Campanula rotundifolia*, with delicate bell-shaped flowers, usually a lovely blue, but sometimes white. Hs., or 'witches' thimbles,' are found chiefly in the N. hemisphere, growing freely among bracken and heather on open downs and hills. The lower (radical) leaves only are heart-shaped, the others being linear (narrow blades). Lindley (1799-1865) tried to establish the spelling 'harebell' with reference to the frail stalk, but it seems to be incorrect. H. was originally in England the *Endymion nutans* (wild hyacinth or bluebell). Always a favourite with poets, it is with them an emblem of purity. The juice yields a fine blue colour, sometimes used as ink.

Harefield, vll. of Middlesex, England, 3 m. N. of Uxbridge. At a former H. Hall, Queen Elizabeth was entertained and Milton's *Areca* was acted. Pop. 3000.

Harefoot, Harold, see HAROLD I.

Harelbeke, Belgian tn. in W. Flanders, on the R. Lys, 3 m. N.E. of Courtrai, engaged in agriculture, the cultivation of tobacco and flax-rettting. There are

manufs. of linen, lace, and oil. It is the bp. of Peter Benoit, a Flem. composer. Pop. 13,000.

Harem or Haram (Arabic *harim*, prohibited, unlawful, sacred), the name given in the E. to that part of the household set aside for the wives and concubines of a Muslim, called also the seraglio, zenana, or *andarun*. The term is also used collectively for all the female members of the household. It is applied also to the mosques at Mecca and Medina, and to the sacred enclosure round a mosque. The H. system is of very antq. origin, and common to most oriental communities, especially where polygamy is allowed. The Koran allows four wives to a Muslim (the sultan may have seven by unwritten law), but there is no limit to the number of concubines except ability to support them. The rules of the H. vary in the different countries, Turkey, India, Egypt, Arabia, Syria, Persia, Siam. Usually the ruler's mother reigns supreme in the royal Hs. Each wife has a separate suite of apartments, with female slaves and odalisques for attendants. Women must all be veiled in public; they have little occupation, and are supervised by eunuchs. No man, unless a near relative, may enter on pain of death. See E. Lott, *Harem Life in Egypt and Constantinople*, 1869; Annie Harvey, *Turkish Harem and Circassian Homes*, 1871; Barnes, *Behind the Purdah*, 1897; W. Ramsay, *Everyday Life in Turkey*, 1897; Van Sommers and Zwerner, *Our Moslem Sisters*, 1907; P. Loti, *Les Désenchantées*, 1906; M. Driver, *The Englishwoman in India*, 1909; and N. Fenzer, *The Harem*, 1936.

Hare's ear, see BUPLURUM.

Hare Stanes, see HOAR-STONES.

Harewood, Earl of, see LASCELLES.

Harfleur (anc. *Harfleurius*, or *Harflorium*, apparently latinised forms of the medieval name *Herofloth* or *Hareflet*), seaport tn. of Seine-Inferieure, France, near the mouth of the Lozarde, about 3 m. from Havre. By common consent H. is identified with the Caractolinum of the *Itinerary* of Antoninus and the neighbourhood is rich in Rom. remains. It has metallurgical works, potteries (for delft and faience ware), distilleries, and sugar-refinery. H. (the harbour on the channel) was captured by the Eng. under Henry V. in 1415. The fine Gothic church is attributed to him. Alternately in the possession of France and England during the early fifteenth century, H. was finally recaptured by Charles VII. in 1450. Its former harbour was silted up by a stream, and Havre replaced it as an important centre. Pop. about 5000.

Hargraves, Edmund Hammond (c. 1816-1891), discoverer of the Australian gold-fields. b. in Hampshire, England. Settling in Australia in 1833, he was a sheep farmer at Sydney from 1834 to 1849. He gained experience as a gold-digger in California in 1849, and struck by the similarity in geological formation between California and the Blue Mts. of New S. Wales, determined to seek for deposits there also. He succeeded in finding gold near Macquarie R., at Lewis Ponds Creek

(1851). He received a reward of £15,000 from the colonial gov., and later a pension. H. wrote *Australia and its Goldfields* (1855).

Hargreaves, James (*d.* 1778), Eng. operative of the eighteenth century. He earned his living as a weaver and carpenter, helping Peel to construct a carding machine in 1760. About 1766 he invented the spinning-jenny used in the manuf. of cotton. His fellow spinners, being strongly prejudiced against machinery and new methods, mobbed him and destroyed his frame. H. removed to Nottingham in 1768, and erected a spinning-mill there. See H. Howe, *Memoirs of the most Eminent American Mechanics*, 1841, and F. Espinasse, *Lancashire Worthies*, 1874.

Haricot, leguminous plant of the genus *Phaseolus*, being a type of dwarf Fr. bean, bearing a seed which is allowed to ripen on the plant, and is widely used, when dried, as a food.

Haridwari, see HARDWAR.

Hari-Kiri, see HARA-KIRI.

Harington, Sir Charles Harington (1872–1940), Brit. general, b. at Chichester, son of E. J. Harington. Educated at Cheltenham College. After passing out of Sandhurst, entered the King's Liverpool Regiment, 1892. Served on the staff in the S. African war, being mentioned in dispatches. In the First World War he was on the staff of Gen. (later F.-M.) Lord Plumer, commander of the Second Army, operating in the Ypres area, and won high opinions for his resourcefulness and qualities of leadership. Promotion was very rapid, from captain at the outbreak of the war to full general in 1927. After the war he became dept. chief of the general staff at the War Office, and further enhanced his reputation both as soldier and administrator, when general officer commanding the army of the Black Sea, by his masterly handling of the serious situation that arose at Chanak on the straits in 1922 on the eve of the war between Turkey and Greece over ter. mandated to Greece under the treaty of Sévres. His negotiations with Mustapha Kemal resulted in a satisfactory and peaceful settlement of the important question of the internationalisation of the straits, at a time when a collision with the Turkish forces appeared inevitable. General officer commanding N. command, 1923–27, and, later, appointed to the command of the W. dist. India. Commander-in-chief, Aldershot command, 1931; governor of Gibraltar, 1933. Retired 1938. He did much to promote the cause of education in the army, being the first colonel-commandant of the Army Educational Corps formed after the First World War. Always known in the army by his nickname, 'Tim.' Wrote autobiography, *Tim Harington Looks Back*, (1940).

Harington, or Harrington, Sir John (1561–1612), Eng. courtier and miscellaneou writer, b. at Kelston, near Bath. He was a favourite with Henry VIII. and became a servant of Elizabeth, at whose court he was famous for his wit. By command of the queen he translated Ariosto's *Orlando Furioso*, 1591, and he entertained her at his house at Kelston in 1592, but in 1596 he fell into disgrace at court on

account of an innuendo about the earl of Leicester. In 1598 he accompanied Essex to Ireland and afterwards wrote an account of the campaign. He was appointed tutor to Prince Henry, eldest son of James I., for whose instruction he wrote *A Briefe View of the State of the Church* (pub. 1653). Among his other writings are *A Tract on the Succession in the Crown* (1602); *The Englishman's Doctor* (1608); *Nugae antiquae* (pub. 1779); and the collected *Epiigrams* (pub. 1613).

Hariot, Thomas, see HARRIOT.

Hariri Abu Mohammed al-Kasem (ul-Qasim) ibn Ali, surnamed Al-Hariri (the silk merchant) (*c.* 1054–1122), Arabian writer. He wrote two treatises on philology: *Mulhat-ul-Irb* (see Pinto's ed. Paris, 1885–89), and *Durrat-ul-Ghawwas* (see Thorbecke's ed., Leipzig, 1871). His chief work is the *Mâdîmat* (Assemblies), fifty *magîmas* in prose and verse. It ranks in the 11. next to the Koran, and has influenced all the nations of Islam. See eds. of *Mâdîmat* by Silvestre de Sacy, 1822; by F. Steinbass, 1896; Ger. trans. by F. Rückert, 1826; Eng. trans. by T. Preston, 1880; by T. Chenevry and F. Steinbass, 1867 and 1898.

Hari-Rud, see HERI-RUD.

Harkness, Edward B. S. (1874–1940), Amer. railway magnate and philanthropist. Both in his own country and in Great Britain he was known for his benefactions to education, and he was a consistent advocate of a closer understanding between Britain and the U.S.A. His largest Brit. benefaction, the Pilgrim Trust, which amounted to about £2,000,000, was made in 1930, and he also enlarged the Commonwealth Fund, which had been created by his mother for providing scholarships for Brit. students to Amer. univs.

Harlaw, locality of Aberdeenshire, Scotland, 18 m. from Aberdeen, noted for the defeat of the Highlanders under Donald, lord of the Isles, by the forces under the earl of Mar, 1411.

Harlebeke, Harlebeke, or Haerlebeke, com. and tn. of W. Flanders prov., Belgium, on the Lys, 3 m. from Courtrai. It has tobacco factories. In Oct. 1918 Gen. Plumer's army reached the l. b. of the riv. here, forcing a passage, a few days later, at Beveren. Pop. 9100.

Harlech, coast tn. par., and anct. cap. of Merionethshire, Wales, 10 m. from Barmouth, on the W. Region railway. The castle was captured by the Yorkists from the Lancastrians (1468), the national Cambrian war-song 'March of the Men of Harlech' perhaps originating during this siege. It held out long for Charles I. Its beautiful ruins still remain overlooking the sea. There are mines of manganese ore. Pop. 2000.

Harleian Manuscripts, collection of valuable MSS., books, and pamphlets (including the earliest known copy of Homer's *Odyssey*), originally made by Robert Harley, first earl of Oxford (q.v.), and increased by his son Edward (1689–1741). Copies of the classics and of Early Eng. poetry are included, as well as many unique illuminated MSS. A

selection of rare pamphlets was pub. as *The Harleian Miscellany*, 1744-46, ed. by W. Oldys (q.v.), who also catalogued the Harleian Library. Much of the collection was acquired for the Brit. Museum for £10,000, in 1753, from Lady Oxford.

The Harleian Society was founded in 1869 (incorporated 1902), for publishing MSS. dealing with genealogy, heraldry, etc. Some 40 vols. of transactions have been issued.

Harlem, part of New York city, U.S.A., extending about 2 m. N. of Central Park, with East R. on E. and H. on N.E. H. has the most prosperous block of the Negro pop. of America, yet even in H. the Negro has to pay higher rents and accept lower wages than the equivalent white classes; and although increasingly powerful politically, and therefore cultivated by the local machine politician, the H. Negro has only very recently begun to get his share of public amenities; thus, there was not a single new school built in rapidly expanding H. between 1918 and 1938.

Harlem River, New York city, properly a strait separating Manhattan Is from the mainland to the N. and N.E. and connecting the Hudson R. with the East R. (i.e. the strait between Manhattan and Long Is.). It is crossed by bridges and is navigable.

Harlequin (Fr. *arlequin*, It. *arlecchino*), equivalent to the Eng. clown. It has been suggested that the character is a survival from Gk. comedy or the Rom. *pantomimus*, but it has no ascertainable connection with either. In the fifteenth century the improvised It. comedy (*commedia dell'arte*, q.v.) had crossed the Alps with its company of jovial characters partly borrowed from masked comedy, though also in great part reflecting the various types of regular comedy ant. and modern, and including Pantalone with Arlechino among other varieties of *zanni*. But whether the traditional costume of the ant. Rom. *mim* or *mimes*—the contumulus or variegated harlequin's coat, shaven head and unshod feet—had before this time become familiar to the provincials has not been decided. The various proposed etymologies of the word H. are mostly speculations; but a long discussion on its origin will be found in Weekley's *Words Ancient and Modern* (consult also Wyld's *Universal English Dictionary*). The character of the early H. was a mixture of extravagant buffoonery with great bodily agility, but in the middle of the sixteenth century his character changed and he became a simple ignorant servant, cowardly, and easily induced to commit tricks and knaveries. In Eng. pantomime he became a lover and magician, whose business it was to protect Columbine from the clown and pantaloons.

Harless, Gottlieb Christoph Adolf von (1808-79), Ger. Lutheran theologian, b. at Nuernberg. His chief works are *Theologische Encyclopädie und Methodologie* (1837); *Die Christliche Ethik* (1842); and his autobiography (1872).

Harley, Robert, Earl of Oxford and Mortimer (1661-1724), son of Sir Edward H., whose family were Whigs in politics.

Robert entered Parliament first for the Cornish bor. of Tregony, but in a short time was elected for New Radnor, which constituency he represented till 1711. In William III.'s reign he acted with the Whigs, but after the accession of Anne, in conjunction with his more celebrated colleague, St. John, afterwards Lord Bellingbroke, he deserted this party and became a leader of the Tories. He was Speaker of the House of Commons in 1701, and chief secretary of state in 1704, which post he resigned four years later. In 1710 he was nominated chancellor of the Exchequer, and in the following year he was invested with the office of lord high treasurer and raised to the peerage with the title of earl of Oxford. He was impeached of high treason in the early part of George I.'s reign, but subsequently acquitted. See *Life and Times of R. Harley, Earl of Oxford* (New York), 1902.

Harlingen, seaport in Holland in the prov. of Friesland, 16 m. W. by S. Leeuwarden. It is intersected by numerous canals, has an excellent harbour, and in normal times carries on an extensive trade with Amsterdam, Norway, the Baltic, and Great Britain. The tn. was overwhelmed by an inundation in 1134 and in 1566, when a dyke was constructed for its future protection. Pop. about 10,400.

Harlington, see under **HAYES**.

Harlow, m.rkt. tn. in Essex, England, in the Epping div., 7½ m. from Ware, on the R. Ica. Here it is proposed to build one of the satellite tns. for redistribution of the industrial pop. of the country. Pop. 3000.

Harmattan, hot E. wind blowing periodically from the interior parts of Africa towards the Atlantic Ocean. It is laden with clouds of reddish dust coming off the desert, and is usually accompanied with a fog and haze that conceal the sun for days at a stretch. It is characterised by extreme dryness, and no dew falls during its continuance—the grass, in consequence, becoming like hay, and vegetation withering. It affects the human body likewise, causing the skin to peel off, but cures skin diseases and checks infection. It prevails at intervals during Dec., Jan., and Feb., continuing sometimes for a fortnight, but more commonly from two to three days.

Harmodius, Athenian, who, in conjunction with his devoted friend, Aristogiton, formed a conspiracy in 514 B.C. to slay the brothers Hipparchus and Hippias, tyrants and joint rulers of Athens. They succeeded in killing Hipparchus, but not Hippias, who seized the reins of government alone, and revenged his brother's death by imposing taxes, selling offices, and putting to death all of whom he entertained the least suspicion. H. was killed, but Aristogiton fled, only to be subsequently taken and executed. Afterwards H. and Aristogiton came to be regarded as patriotic martyrs, and received divine honours from the Athenians, who raised statues to their memory.

Harmonica, musical instrument from which the sounds are produced by the friction of moistened fingers on glass or metal tubes, used in the eleventh century, but nowadays a toy. Beethoven and

Harmonical

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Mozart wrote music for it. There was a later form with a keyboard. The name H. belongs properly to Benjamin Franklin's mechanised form (c. 1762) of the seventeenth-century musical glasses. See, for a description of his invention, *International Cyclopaedia of Music*, and, for a detailed discussion, *Oxford Companion to Music*.

Harmonical Progression, name given to a series of quantities in which any three consecutive terms a, b, c are connected by the relation $\frac{a}{c} = \frac{a-b}{b-c}$. From this it may

be easily proved that $\frac{1}{a}, \frac{1}{b}, \frac{1}{b}, \frac{1}{c}$, i.e. that $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}$ are in arithmetical progression.

Hence the reciprocals of the terms of an H. P. form an arithmetical progression. Thus $\frac{1}{a}, \frac{1}{b}, \frac{1}{b}, \frac{1}{c}, \dots$ form an H. P. No general formula can be found for the sum of any number of terms, and questions on H. P. are solved generally by the use of the above property. The middle term of any three in H. P. is known as the harmonic mean of the other two, and hence the harmonic mean between a and c is $\frac{2ac}{a+c}$.

Harmonic Engine, instrument invented by Edison, by means of which the energy of an electric current is used to sustain the vibrations of a large, heavily weighted tuning-fork, the arms of which are connected with two pistons, which work a small pump. This pump compresses air, and is able to drive sewing-machines, etc.

Harmonic Motion, general name given to motion of natural vibration and oscillation. Thus it includes the oscillation about the position of equilibrium of a weight supported by a spring or an elastic string; the small oscillations of the bob of a pendulum, the vibration of any point on the string of a musical instrument, and finally wave motion in general, of which the last example is a particular case. Thus, if a series of waves moves regularly over any surface, any point on the surface will move up and down with H. M. If equal and opposite waves move in opposite directions, certain points called *nodes* will remain fixed; and this is the case with the strings of a musical instrument fixed at

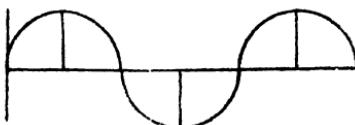


FIG. 1. CURVE OF SINES

two ends which are nodes. If a pencil moving vertically up and down with the simplest form of H. M. traced a locus on a piece of paper which moved horizontally with a uniform velocity, it would trace out the curve in the figure known as the *curve of sines*. It will be recognised by the student of trigonometry as the graph of $\sin x$ (Fig. 1). The most elementary form of H. M. is known as *Simple Harmonic Motion*.

Harmonic Motion

Motion. Let a point X (Fig. 2) move with uniform velocity along the circumference of a circle, and let XP be the perpendicular on any fixed diameter AB. Then P will move with simple H. M. It will be seen that P moves continually backwards and forwards along AB, coming to rest instantaneously and turning back again at

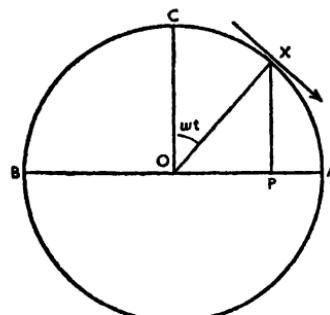


FIG. 2. SIMPLE HARMONIC MOTION

A and also at B, and having its biggest velocity when passing through the centre O. The time taken over one complete journey backwards and forwards is called the *period*. The time to any position since last passing through the middle point O going in a direction previously fixed as positive is called the *phase*, and OA is the *amplitude*. If ω is the constant angular velocity of OX, and t the time from C, the end of the perpendicular diameter to AB, to the point X, then the angle COX is ωt , and $OP = r \sin \omega t$, where r is the radius of the circle. Hence it may be seen why the locus traced in Fig. 1 is a curve of sines. The period is the time for X to go once completely round the circumference, i.e. $2\pi/\omega$, and this result is seen to be independent of the amplitude a . Since X has a velocity $a\omega$ along the tangent to the circle, and by virtue of its circular motion an acceleration $a\omega^2$ along XO, it will be seen that P has a velocity $a\omega \cos \omega t$ along OA and an acceleration towards O, $a\omega^2 \sin \omega t$, i.e. $\omega^2 XOP$. Thus a point moving with simple H. M. has an acceleration directed towards the centre, which varies directly as its distance from the centre. As the point P passes through O on its backward journey, the acceleration becomes a retardation and is still proportional to the distance from O. This very important property is sometimes taken as the definition of simple H. M. The more complicated forms of H. M. may be obtained by compounding two or more simple H. Ms. Thus any point of a vibrating string fixed at its two ends, where the motion is made up of ten equal and opposite wave motions, moves with two equal and opposite simple H. Ms. in the same straight line. Another simple case occurs in the compounding of two simple H. Ms. of equal periods, but different

amplitudes a and b , along two lines Ox and Oy where the locus of the point is the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

Harmonics, or Partial Tones, as Helmholtz more correctly terms them in his *Sensations of Tone*, are the tones which sound over any pure musical note, their pitch being regular and governed by mathematical laws. If a taut string be plucked, for instance, vibrations are caused and a fundamental or predominating note is given; furthermore, not only does the whole string vibrate, but its aliquot parts also, each part having its corresponding sound according to the "period of vibration." Half the same length of string gives a note an octave higher; one-third, a fifth higher; one-quarter, a sixteenth higher, and so on. These notes give the intervals of the common chord of the diatonic major scale, of which they are the theoretical basis. The production of harmonics on both stringed and wind instruments is used as a technical resource. Helmholtz showed that harmonics affect tone-quality.

Harmonium, musical instrument invented in modern times which produces sounds similar to those of an organ by means of an arrangement known as the "free vibrating reed," acted upon by a current of air from a bellows worked by the feet. The invention is ascribed to Alexandre Debain of Paris, though he only perfected an instrument previously known, called the *orgue expressif*, and the same principle followed in the construction of this kind of organ was applied to the H. The feet communicate a more or less rapid movement by the action of two pedals, according to the shades of expression which are to be brought out, and the air is made to impinge against thin tongues of

wind-pressure, the volume being merely increased or decreased. Some Hs. are made with two rows of keys, with pedals for the feet, similar to organ pedals, attached. This instrument may be had in various sizes and qualities. The best known makers are the Alexandre and Mustel in France, and Bauer in England. A similar but inferior instrument is the 'seraphine,' and Messrs. Mason and Hamlin in 1861 introduced a kind of H. called the Amer. organ, which acts by suction and works by exhaustion bellows instead of by force bellows. Since Debain's invention many improvements have been made to the H., the chief of which are the addition of a knee action, serving as an expression stop, or bringing into play at once all the stops; and the percussion action, the invention of Kaufmann of Dresden, which consists of the addition of small hammer which aids the action of the wind by striking the vibrator as soon as the key is pressed down.

Harmony, science treating of the laws which govern the relation of tones in chord-combinations and of the progressions between such combinations. The earliest attempt at H. seems to have consisted in adding a drone bass, sustained as an accompaniment throughout a melody, somewhat in the style of the modern device of pedal-point, e.g., as in the bagpipes. The Gks. had some knowledge of theoretical H., although for some reason no practical application was attempted; and to understand the development of modern H. it is necessary to discuss in some detail the Gk. Pythagoras may be credited with the origination of the science of musical acoustics; the units derived were the octave and the tetrachord, i.e. the div. of tones in the interval of a fourth. There were three tetrachords, which may be represented thus:



FIG. 1. TETRACHORDS

Of these only the diatonic has survived in three forms

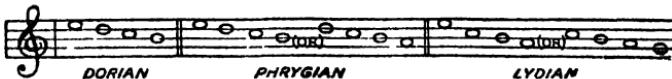


FIG. 2. FORMS OF DIATONIC

metal, and sets them vibrating. Debain's invention of the H. in 1840 became more or less the model of all others that have followed. The H. is about 3 ft. 3 in. high, and 4 ft. broad, and occupies little space. It has a compass of five octaves of keys from C to C, the keyboard being placed on the top, just below the lid. Under this is the bellows-board with the valves for each key, and the different rows of reeds are above the valves. A peculiarity of the free reed is that the pitch of the sound is not altered by the increase or diminution

From these tetrachords the scales were derived. Fig. 3 shows the relation between these scales (or 'species') and the full Pythagorean scale, as far as the disposition of their intervals is concerned, the question of pitch being immaterial in F-practice, although absolute in theory.

From this system the elaborate medieval church modes shown in Fig. 4 were derived; but the difference between Gk. and ecclesiastic scales bearing the same name is worthy of note. Incidentally,

too, whilst the intervals were read downwards in Gk., the modern practice of reading them upwards was used in church music at this time.

It is unnecessary here to do more than mention the hexachord system, which was later substituted in ecclesiastic music for

ments in the direction of modulation. During the period when these changes were being evolved, an advance was made in the addition of a single part, either in fourth, fifth, or octave, to a canto fermo; and in the eleventh century the method of *discantus* came into vogue, i.e. the singing

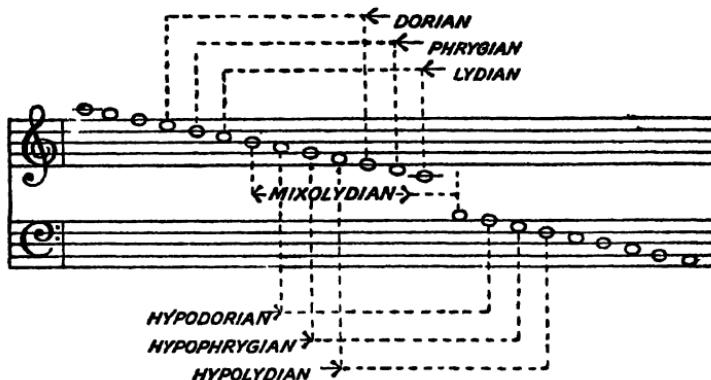


FIG. 3 RELATION BETWEEN SCALES (OR SPECIES) AND THE FULL PYTHAGOREAN SCALE

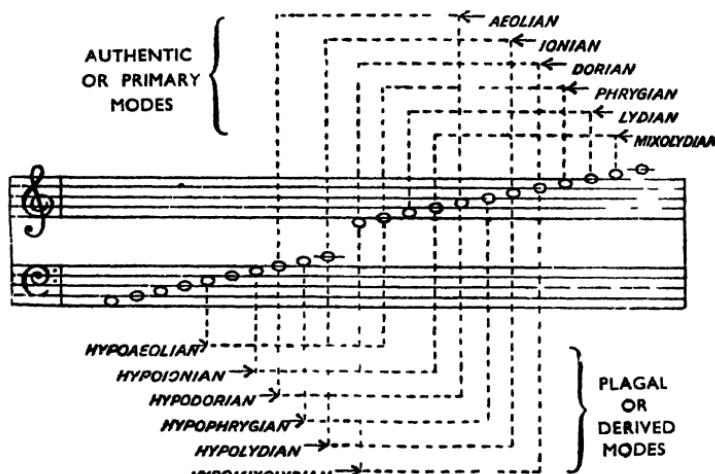


FIG. 4. MEDIEVAL CHURCH MODES

the Gk. tetrachord system. The hexachord, a group of six consecutive notes, regarded as a unit for singing at sight, was introduced by Guido d'Arezzo in the eleventh century. But in Guido's time H. had barely begun and the element of chromaticism (see CHROMATIC SCALE), was entirely wanting, only one inflected note being in use. The addition of B flat to the scale made possible wider experi-

together of two independent subjects or melodies, so constructed as to produce two-part H. Other devices were tried in the course of the next two or three centuries; chords were grouped in some crude classification, and attempts made to formulate their progressive principles. The *disceantus* had led to the reduction of subjects to regular rhythm, and had also laid the foundation of counterpoint; and

by the end of the fifteenth century polyphony (*i.e.* the contrapuntal weaving together of separate melodic parts) was on a fairly sound footing—four-part writing had been attained, and inversions, passing notes, discords, and chromatics had arisen. The sixteenth century was an age of brilliant achievement under such men as Josquin, Lassus, and Palestrina. But before further progress could be made it was necessary that the limitations and prejudices of the Graeco-ecclesiastic modes, which still prevailed, should be superseded. So far, chord-combinations had been regarded as incidental to polyphony. It was Monteverdi who early in the seventeenth century broke away, by using unprepared dominant sevenths and other unheard-of discords, thereby forming the transition to the new conception of chord-combinations, *i.e.* that a chord is a separate entity possessing tonality and value not only relatively, but intrinsically. Rameau (*d.* 1764) attempted to formulate the principles of root-derivation of chords and the laws of relation between roots which governed chord-progressions; and the efforts of Tartini (*d.* 1770) must also be



FIG. 3. COMMON CHORD OR TRIAD

mentioned. The great consummation of this period is to be found in the works of J. S. Bach (*d.* 1750), whose wonderful instinct for H. enabled him to evolve the science of relationship between consonance and dissonance, in such devices as passing notes, to an unprecedented stage of advancement. Meanwhile, the shortcomings of the ecclesiastic modes had been becoming more and more apparent, and the attempts at systematisation had resulted in the evolution of the modern major and minor scales. Bach was chiefly responsible for the practical application of theoretical equalisation of keys (see TEMPERAMENT) in tuning; and in these circumstances great progress was made in modulatory experiments, *e.g.*, the invaluable device of 'enharmonic change'. The fundamental idea of modern H. is that of concord. The common chord (Fig. 5) or triad (A), or either of its inversions (B) and (C), called respectively the first and second, gives a perfect consonance which is correct aesthetically by reason of its finality and completeness, and scientifically according to the laws of harmonics (see H. von Helmholtz, *Sensations of Tone*, 1875). As opposed to concords, we have discords, or dissonant chord-combinations, which must be resolved into their relative concords before a complete idea can be expressed; unresolved discords leave a sense of incompleteness to the ear. The most familiar discord is the dominant seventh which is resolved into the triad of the tonic, *i.e.* of the keynote on which it is based (Fig. 6). This progression is the

basis of H. To use a graphical illustration, it may be said that the points of a composition are plotted in concords, and the lines filled in by discords. In academic and classical music, the resulting graph is of regular shape; in romantic and modern, less regular, as a general rule. In the most modern music the treatment of

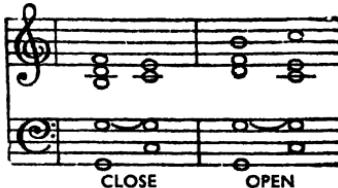


FIG. 6. DOMINANT SEVENTH (PERFECT CADENCE)

discord is carried to very elaborate lengths, and an emotional expressiveness of extreme intensity is often obtained. The aesthetic or practical application of H. has always been ahead of the scientific (except in cases of Gk. music); and every composer of importance has suffered at the hands of critical jurists for breaking academic laws, *e.g.* Gluck, Haydn, Beethoven, and the later Romantics, Wagner, Scriabin, and Stravinsky. Contemporary harmony is the logical outcome of the practice of preceding generations, and occupies itself more with the harmonic (perpendicular) view than with the contrapuntal (horizontal) one. The number of scales in use is very much larger than of old, important among them being numerous variations of the diatonic scale, the dodecuple, and the whole-tone (Fig. 7).



FIG. 7. VARIATIONS OF THE DIATONIC SCALE

Atonality (the abandonment of a fixed keynote) is practised (*e.g.* Schönberg), and new chords, built up not only from thirds as in older practice, but also from fourths, fifths (perfect, augmented, diminished), and seconds (major or minor), have passed into currency. Double and treble tonality, whereby two or three keys can be heard

at once, are used (*e.g.* Bartok, Stravinsky, Holst), and the relations between harmony and rhythmic pattern are becoming better understood and effectively applied (*e.g.* notably Stravinsky). See Sir H. Parry's article on 'Harmony' in Grove's *Dictionary of Music and Musicians*, and for modern tendencies the authoritative article in Dent's *Dictionary of Modern Music and Musicians*; also Sir D. Tovey's in the *Ency. Brit.* works by Stainer and Macfarren, and A. Eaglefield-Hull, *Modern Harmony*, 1913.

Harmony term used by Leibnitz to denote the relation existing between the monads or ultimate psychical units of his metaphysical system. He holds that substance exists only in the form of atoms, each a self-contained individuality, and that the entire series is so constituted that each is at every moment in perfect *harmony* with all the rest, though at the same time obeying the laws of its own self-determined development. This system pertains to the very highest and to the very lowest, and since God is the contriver of universal fl., this world must be the best of all possible worlds. Leibnitz describes the relation of monads as 'a harmony pre-established by a contrivance of the divine foresight.'

Harmony of the Gospels, see NEW TESTAMENT.

Harmsworth, Sir Alfred Charles William, see NORTHCLIFFE, VISCOUNT.

Harmsworth, Sir Harold Sidney, see ROTHERMERE, VISCOUNT.

Harnack, Adolf von (1851-1930), Ger. theologian and historian, b. at Dorpat in Estonia, where his father, Theodosius H., held a professorship of pastoral theology. His lectures dealt with gnosticism and the Apocalypse. The first vol. of his epoch-making work, *Lehrbuch der Dogmengeschichte*, of which there is an Eng. trans. in 7 vols., was pub. in 1885. In this work H. traced the rise of dogma. In 1893 he pub. a hist. of early Christian literature down to Eusebius, entitled *Geschichte der urchristliche Litteratur bis Eusebius*; and in 1900 appeared his popular lectures, *Das Wesen des Christenthums*. He also wrote *Die Mission und Ausbreitung des Christentums in den ersten drei Jahrhunderten* in 1902, and some interesting and important N.T. studies, which have been trans. into Eng.: *Luke the Physician* and *The Sayings of Jesus*. H.'s distinctive characteristic is his claim for absolute freedom in the study of church hist. and the N.T. H. occupied a professorship at Marburg, 1886-89; at Berlin, 1889-1924. In 1914 he was ennobled. See life by Agnes von Zahn-Harnack, 1936.

Harold, or Harald (850-933), first king over Norway, surnamed Harfagr (beautiful-haired), son of Halfdan the Black. He vowed not to cut or comb his hair till he was sole king of Norway; ten years later he fulfilled his oath and exchanged the name of Shockhead for Beautiful Hair. In 886 he made his first conquests over the petty states that divided Norway, and in 972 found himself master of the whole kingdom. His opponents fled to the isles of the Orkneys, Shetlands, and Hebrides.

Later he was forced to make an expedition against them. He secured the Scottish isles, and the remaining Vikings fled to Iceland and founded a commonwealth there. At the end of his reign his sons quarrelled over the succession; he assigned them lands and royal titles, leaving the chief power to his favourite son, 'Erik of the bloody axe.'

Harold (936-86), king of Denmark, surnamed Blue-tooth, son of Gorm the Old. He obtained the overlordship of Norway on the death of Harold Harfagr. He was baptised in 960, to conciliate the Emperor Otho, and tried to convert Denmark to Christianity. He was driven from his country by his son, Sweyn I. (Svend Forkbeard), the leader of the pagans. H. d. during his flight. See life by T. Torseus, 1707.

Harold I. (d. 1040), surnamed Harefoot, the illegitimate son of Canute, king of England. On the father's death (1035) he claimed the crown with the support of Leofric, earl of Mercia. The Witan at Oxford elected him regent, while the rightful king, Hardicanute remained in Denmark; the latter stayed away so long that H. was crowned king in 1037. He d. suddenly at Oxford while Hardicanute was preparing to invade England.

Harold II. (c. 1022-66), king of the Eng., second son of Earl Godwine. While still very young he was made earl of the E. Angles. He was outlawed and banished with his father in 1051, taking refuge with his brother Leofwine in Ireland. The family was recalled, and H. was restored to his earldom. On his father's death (1035), he succeeded to the earldom of the W. Saxons, becoming the first minister to the king, Edward the Confessor d. in 1066, leaving his throne to H., who was immediately crowned. William duke of Normandy challenged the Crown, alleging that Edward left the Eng. throne to him, and that H. was under an oath, extorted from him in Normandy during his exile. H. was now attacked on both sides: Duke Wm. landed at Pevensey in Sussex, and Tostig of Northumberland, H.'s brother, with Harold Hardrada, king of Norway, sailed up the Humber and subdued York; they were defeated at Stamford Bridge, and while the two earls, Edwin and Morcar (Morkere) (q.v.), kept back the N. invaders, H. marched S. and engaged the Normans on the hill of Senlac, near Hastings. H. was defeated and slain with two of his brothers. He was the last of the Saxon kings. See E. Lytton, *Harold, the Last of the Saxon Kings*, 1848, and Hope Muntz, *The Golden Warrior*, 1949.

Harold III. or Harald (1015-66), king of Norway, surnamed Hardrada, or Hardrada (the ruthless), son of King Sigurd and half-brother to Saint Olaf. When fifteen years old he fled from Norway after fighting at the battle of Stiklestad (1030), where King Olaf was slain. He found refuge in Novgorod, and then went to Constantinople, where he commanded the Varangian guard of the Empress Zoë; he won various victories in Italy and N. Africa, and then decided to return home. On his way back he married Elizabeth of

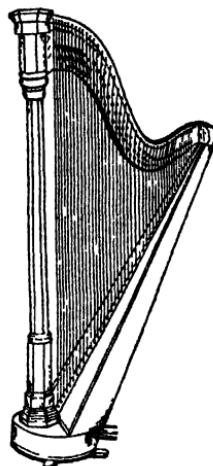
Novgorod. He now allied himself with Sweyn (Svend) of Denmark against his nephew Magnus, king of Norway, but accepted half Norway as a gift from Magnus, and strove to keep the peace. On the death of his nephew he became king and attempted to conquer Denmark; having failed he agreed to peace. He invaded England with Earl Tostig of Northumberland, and was defeated and slain at Stamford Bridge by the Eng. Harold.

Harold's Cross, see DUBLIN.

Haroun al-Rashid, or **Harun al-Rashid** (763-809), b. near Teheran, and succeeded to the caliphate in 786. He made the Barmecide Yahya his grand vizier, and left the entire administration of his extensive dominions to him and his four sons, in whose sagacity his confidence was well placed. Haroun meanwhile devoted himself to the pleasures of life, and his court at Bagdad became a brilliant centre of all the wit, learning, and art of the Moslem world. Towards the close of his reign he developed a hatred of the Barmecides (q.v.), and caused the vizier and his four sons to be executed. His affairs immediately fell into confusion, and treason and rebellion broke out. Haroun marched against the rebels, but d. at Tus of an apoplexy. A highly coloured but false picture of his memory is found in the *Arabian Nights* stories. See E. Gibbon, *History of the Decline and Fall of the Roman Empire* (J. B. Bury's ed., 1898, vol. vi.).

Harp (A.-S. *hearpe*, Old High Ger. *harfa*), musical stringed instrument which was greatly esteemed by the ancts. The Egyptians played it from very early times, though there is no reason to suppose that they were its inventors. The Egyptian H. was bow-formed, had no front pillar, and was strung with catgut; it was of great size, often standing over 6 ft. high, and the pedestal was profusely decorated with jewels and carvings; many varieties are found in ant. sculptures and paintings. The Assyrian H. resembled the Egyptian, except that the sound-body was placed uppermost. Nothing definite is known as to the shape of the Heb. or biblical H., but it was probably a small hand instrument bearing more resemblance to the lyre. In the earliest records of Celtic hist., the H. is given a prominent place; the old Scottish instrument was about 3 ft. high and had thirty strings. One of the earliest specimens, known as the *clarsach Iamondach* or Lamont's *clarsach*, was taken from Argyllshire by a lady of that family on her marriage, about 1460. Its use has recently been revived. The oldest and finest specimen of the beautiful Irish H. is contained in Trinity College, Dublin, and dates from the fourteenth century; there is a cast of it in the Victoria and Albert Museum. The old Welsh H. resembled the Irish one, but the modern instrument is triple-strung. The ordinary It. H. has two rows of wire strings, but it is an imperfect instrument and now almost obsolete. A Bavarian maker, Hochbrucker, invented the single-action pedal in 1720, but it is to Sébastien Erard that we owe the power and sweetness of the modern

pedal instrument. For many years he worked at the invention of a double-action pedal, and gained a great triumph on the production of his mechanism in Paris, 1810.



HARP

Harpagus, general of Cyrus the Great, the Persian monarch. He conquered the Carians, Lycians, and Asiatic Gks. about 540 B.C.

Harpe, Jean François de la, see LA HARPE.

Harpden, par. and urb. dist. mostly residential, in Hertfordshire, England, 25 m. from London. Sir John Bennett Lawes began his systematic experiments in agriculture at Rothamsted (1843) near by, and in 1859 provided an endowment of £100,000 for the continuance of the experiments. Pop. 1,200.

Harper's Ferry, tn. of Jefferson co., W. Virginia, U.S.A., situated at the confluence of the Rrs. Shenandoah and Potomac. In 1796 a U.S. armoury and arsenal was estab. there. This was seized in 1859 by John Brown (q.v.), the abolitionist, but only held till next day. In 1862 the garrison under Col. Miles surrendered after some fighting to Stonewall Jackson (q.v.). The Federal loss amounted to 12,500 taken prisoners, and 13,000 small arms. Col. Miles d. of his wounds immediately after the surrender. Pop. 1,000.

Harpies, see HARPYLE.

Harpignies, Henri Joseph (1810-1916), Fr. landscape painter, b. at Valenciennes. He became a friend of Corot, and went with him to Italy, and in 1861 he made his first great hit at the Salon with his 'Lisière de bois sur les bords de l'Allier.' He was a fine draughtsman, and his work, though showing something of the influence of Corot, is distinctive. He obtained his first medal in 1886, for 'Le Soir dans la campagne de Rome,' but his most famous picture is perhaps 'Le Saut de Loup.'

(1873), in the Luxembourg Gallery. In 1870 he showed a panel at the Salon, 'La Vallée Égérie,' done for the Paris Opéra.

Harpocrates, see HORUS.

Harpocration, Valerius, Gk. grammarian. He wrote a lexicon, *Λεξικὸν τῶν δέκα ἡγέτων*, containing notes on well known people and events spoken of by the orators, with explanations of legal and commercial terms, and as most works of the kind have been lost this is of considerable value. He was of Alexandria, and may have been the Gk. tutor to Antoninus Verus (second century A.D.), mentioned by Julius Capitolinus (*Life of Verus*), or if, as some authorities aver, he borrowed from Athenaeus (q.v.) his date would have been much later.

Harpischord, musical instrument which was in vogue especially in the seventeenth and eighteenth centuries, and which developed into the invention of the modern grand pianoforte (q.v.). Outwardly it resembled that instrument in shape, though it was also made with two keyboards and stops, but instead of the hammer action of the piano the tones were produced by quills fixed in the centre tongues of wooden uprights called jacks, which when the note was struck twanged or twirled the strings, thus emitting the sounds. The notes thus produced were of necessity sharp and metallic, and, though lending themselves to brilliant technical performance, it was difficult to make them expressive, but a good deal was done by means of stops and the double keyboard, especially that invented by Hans Ruckers about 1640, the Ruckers of Antwerp being the most famous H. makers. Handel possessed one made by this firm, which is now preserved at Buckingham Palace. In 1766 a maker named Tschudi made some beautiful instruments for Frederick the Great. Through him and Kirkman many great improvements were made, pedals being introduced for the first time. The 'harp' stop and the 'swell,' a device worked by a pedal, were the inventions of Roger Plenius, who was the first to make a pianoforte (or lyrichord) in England. The older spinet and virginal belonged to the same family as the H., but the latter had as many as four strings to a note, while the other had only one. The H. held an important place in the orchestra of its time, being played always by the conductor, and it was first displaced by the composer Gluck. The last recorded occasion of its public use in England was that of the performance of the ann. 'King's Birthday Ode' at St. James' Palace in 1795; but there has, in recent years, been a revival of the instrument.

Harp, The, see LYRA.

Harp, or Harpy Eagle (*Thrasaetus harpyia*), bird of prey which inhabits the tropical regions of S. America from S. Mexico to Brazil, and which is variously referred by ornithologists to the hawk, buzzard, and eagle families (see FALCONIDÆ). Its salient features are its powerful talons, with which it pounces on monkeys, sloths, and fawns, and its enormous hooked beak. The H., so-called after the legendary Hs.

of the Gks., has a white head, breast, and belly, save for one dark pectoral band; a black tail barred with grey, a black back, and grey dusky wings. The face is owl-like, and the head crested. In flight it is slow and heavy, as the soft feathers and small wings would lead one to expect. Too much faith must not be reposed in the fabulous tales of its voracity told by the early naturalists.

Harpyses, or Harpies, originally personifications of sudden wind storms which snatched away people (*Iliad*, xvi. 150). Homer mentions one only. Podarge, who in the shape of a mare bore to Zephyrus the horses of Achilles. Hesiod represents them as winged goddesses, but later writers describe them as spirits of evil, half maidens, half birds. In the story of the Argonauts the gods sent them to torment Phineus, by either defiling or carrying off his food. See J. C. Lawson, *Modern Greek Folklore*, 1910.

Harquebus, see ARQUEBUS.

Harrar, or Harar, tn. and trading centre of Abyssinia, the chief place in the Galla country, connected by railway with Driodawa, and with Jibuti, the port of Fr. Somaliland, on the gulf of Aden. It is built on slopes of a hill at an elevation of over 5000 ft. Exports include coffee, ghee, gums, wax, ivory, hides, and skins. It was seriously damaged in aerial bombardment in the Italo-Abyssinian war of 1935. Its capture by the Brit. forces in the It. E. African campaign, in March 1941, marked the beginning of the ultimate collapse of the whole of Mussolini's African colonial empire. Pop. 40,000.

Harrier, breed of dog which hunts the hare by scent. In qualities and general appearance a H. closely resembles a foxhound, from which, indeed, it was probably at first derived. However, it is built on a smaller scale and usually is not taller than 22 in., whereas a foxhound frequently attains to 27 in. Hs. can hunt a much colder scent than their prototype, but are not so swift-footed. There are over 150 packs in the Brit. Isles, and the Hs. are especially a feature of Irish country life, where hare-hunting is a most popular sport.

Harrier (*Circus*), genus of non-arbooreal Falconidæ (q.v.). Hs. are often called hen-harriers, because of their predilection for poultry as their prey. They have long legs and wings, insignificant beaks, an owl-like frill of thick-set feathers round the face, and soft plumage. They live on frogs, birds, snakes, and small mammals, and chiefly frequent marshy dists. At one time the *C. cyaneus*; or hen-harrier, and the *C. aeruginosus*, or marsh-harrier, were common in the Brit. Isles, but they are now more or less rare, the draining of the marshlands having deprived them of so much of their congenial habitat. Hs., including the *C. cinereus* and the *C. cineraceus*, etc., are distributed all over the world. The Amer. marsh hawk (*C. Hudsonius*) is very like the hen-harrier, but, in the male bird, the lower markings are rufous.

Harriman, William Averell (b. 1891) Amer. administrator and diplomatist

Graduated from Yale Univ., 1913. Vice-president in chief of purchases and supplies of Union Pacific Railroad Company 1914-18, and chairman of the board of the company from 1932. Member of business advisory council for the Dept. of Commerce, 1933-37, and chairman, 1937-1940. He joined Roosevelt's National Recovery Administration in 1934, becoming special assistant administrator. Associated with Industrial Materials Div., National Defence Advisory Commission, 1940. Chief of the Materials Branch Production Div., Office of Production Management, Jan.-March 1941. Appointed President Roosevelt's special representative in Great Britain with the rank of minister, 1941. Special representative of the President and chairman of the President's special mission to Russia, with rank of ambas., 1941. U.S. representative in London of Combined Shipping Adjustment Board, 1942. In that year he was chief lend-lease officer in London and member of London Combined Production and Resources Board. U.S. ambas. to Russia, 1943-46; to Britain 1946-48. Shared with Paul Hoffmann and Tom Finletter responsibility for the administration of the European Recovery Programme in its application to Britain.

Harrington, or Harrington, James (1611-1677), Eng. political philosopher, b. at Upton, Northamptonshire. He spent some time in the suite of Charles I. during his imprisonment, and on the king's death devoted himself to the composition of *Oceana*, a somewhat dull but very minutely worked-out scheme for an oligarchical republic. In 1659 he formed the 'Rota' Club to try to push the practical application of his theories. In 1661 he was imprisoned by Charles II. on charge of conspiracy. See his *Works*, ed. with biography by John Toland in 1700. (Toland's ed. was republished with additions by Birch in 1747.) See also H. F. Russell-Smith, *Harrington and his 'Oceana'*, 1914.

Harrington, Sir John, see HARRINGTON.

Harrington, par. and seaport on the W. coast of Cumberland, England, 2 m. S. of Workington. It has shipbuilding yards, coal-mines, blast furnaces, and manuf. iron goods and fire-bricks. Pop. 5000.

Harriot, or Hariot, Thomas (1560-1621), Eng. mathematician and astronomer, b. at Oxford. He became tutor to Sir Walter Raleigh, who appointed him to the post of geographer to the second expedition to Virginia (1585), an account of which voyage was pub. by H. in 1588, and afterwards reprinted in Hakluyt's *Voyages* in 1600. H. virtually gave to algebra its modern form. See H.'s *Ephemeris chrysometria et Artis analyticae praxis ad equationes algebraicas resolvendas* (1631). See also J. Wallis, *History of Algebra*, 1685; H. Stevens, *Thomas Harriot*, 1900; and the *Harriot Papers* (ed. by S. Rigaud, 1831).

Harris, Sir Arthur Travers (b. 1892), Brit. air marshal. In the First World War he served with the 1st Rhodesian Regiment on the W. front and in 1918 joined the R.A.F. Group captain, 1933;

air commodore, 1937; air vice-marshal, 1939; deputy chief of air staff, 1940-41; air marshal, 1941; head of R.A.F. delegation to the U.S.A., 1941; air chief marshal, 1943; member of the combined Brit.-Amer. chiefs of staff, 1942. As commander-in-chief, Bomber Command, 1942-45, he was responsible for Brit. policy in the bombing of Germany and Ger.-occupied countries of Europe. Promoted marshal of the R.A.F., 1945. He pub. *Bomber Offensive*, 1947.

Harris, Frank (1854-1931), Brit. author, b. in Galway, Ireland. Went to U.S.A. 1870 and became a naturalised Amer. citizen. Successively editor of the *Fortnightly Review* and *Vanity Fair*. Founder and editor of the *Candid Friend*. His life of Oscar Wilde (1916) was severely criticised for its frankness. Other biographical studies which he pub. were *The Man Shakespeare* (1909); *Contemporary Portraits* (four series, 1915-23); and *G. B. Shaw* (1931). Novels: *The Bomb* (1908); *Great Days* (1914); and *Love in Youth* (1916). His vols. of short stories are *Elder Conklin* (1894); *Montes the Matador* (1900); *The Veils of Isis* (1915); and *A Mad Love* (1920). He also wrote the plays *Mr. and Mrs. Dacentry* (1900); *Shakespeare and His Love* (1910); *Women of Shakespeare* (1911); and *Joan la Romée* (1926). His autobiography, *My Life*, was pub. in 1926.

Harris, George Robert Canning Harris, fourth Baron (1831-1932), Brit. politician, soldier, administrator, and cricketer; b. Feb. 3; son of third baron. Educated Eton and Christ Church, Oxford. Under-secretary for India, 1885-86; under-secretary for war, 1886-89; and governor of Bombay, 1890-95. It was largely due to his efforts and influence as a cricketer that Kent reached a high position among the cos. He was elected president of the Marylebone Cricket Club (M.C.C.) in 1893. Pub. *A Few Short Runs* (1921).

Harris, James, see under MALMESBURY. EARL OF.

Harris, James Rendel (1852-1941), Eng. biblical scholar, b. at Plymouth; educated at Plymouth grammar school and at Cambridge Univ. In 1882 he went to the U.S.A., where he was prof. of N.T. Gk. at Johns Hopkins Univ. 1882-85, and of biblical languages at Haverford College, 1886-92. Curator of MSS. at the John Rylands Library, 1918-25. He was lecturer of paleontology at Cambridge Univ. from 1893 to 1903, prof. of theology at Leyden 1903-4, and was made Haskell lecturer at Oberlin College in 1910. His studies and works, which gave him a place among the leading N.T. scholars, included *Study of Codex Bezae* (1890); the lost *Apology of Aristides* (1891), an important Syriac MS. of the seventh century which he discovered in a convent on Mt. Sinai in 1889; *The Cult of the Heavenly Twins* (1906), and *Bornenses* (1913), two books on the Dioscuri legend; *Side-lights on New Testament Research* (1909); *The Odes and Psalms of Solomon* (1910), a collection of primitive Christian hymns; *The Origin of the Prologue to St. John's Gospel*; and *Testimonia* (1917-20). In his Eucharistic

Origins (1927) he maintained that the Christian Eucharist was taken over almost bodily from the Egyptian mysteries of Isis and Osiris, and he also advanced the theory that the Egyptians built Stonehenge. Other publs.: *The Teaching of the Apostles and the Sibylline Books* (1900); *Fragments of Philo*; *The Acts of Perpetua* (1887); *Some Syrian and Palestinian Inscriptions*; *Lectures on the Western Text of the New Testament* (1894); *Letters from Armenia* (1897); *Double Text of Tobit*; *The Diocuri in Christian Legend* (1903); *Iaron's Braesdale*; *Origin of the Cult of Dionysus* (1915); *Further Traces of Hittite Migration* (1927); and books about the *Mayflower*.

Harris, Joel Chandler (1848-1908), Amer. author, b. at Eatonton, Georgia. His father's name is not recorded in his daughter-in-law's biography of H., H. being the family name of his mother who had eloped with his father and was then de-erected. The mother supported H. by sewing. As a youth he was ambitious to write and it is said that this desire was fostered by Joseph Turner, publisher of the *Countrymen*, an enterprising and successful plantation paper, to which H. contributed articles of interest to juveniles. When the civil war devastated Turner's plantation and ruined him, H. found work in a newspaper office at Macon. Thenceforward he was a journalist—a writer of light articles, a paragrapher, and inventor of "stunts." Later an article in Lippincott's magazine on the subject of Negro folklore suggested his famous Remus stories which first appeared in the *Atlanta Constitution* in 1878, and were pub. in 1880 as *Uncle Remus: his Songs and Sayings*. For the next twenty-five years he returned ever and again to this character as the mouthpiece for such Negro legends as he could gather, though in the meantime he wrote other books which were not negligible, such as *The Old Plantation* (1889) and *Free Joe* (1887), all useful as records of life in Georgia but not of the universal interest of the famous Remus stories. The pub. of the first book of Remus stories let loose on H. a flood of correspondence, suggesting that the Negroes had acquired them from the Redskins, that variants of the stories could be found among the natives of Brazil, India, or Samoa, or yet again that they were universal myths. But as well as correspondence, the stories enriched H. and this gave him leisure to interest himself in the ethnological side of the legends he diligently gathered for the rest of his life, though he always disclaimed any higher status than that of a recorder—albeit one with a rare skill in catching and reproducing the diction and rhythms of the Negro. He also wrote a hist. of Georgia from the *Invasion of De Soto to Recent Times* (1890). See lives by R. L. Wiggins, 1918, and Julia C. Harris, 1918.

Harris, John (c. 1666-1719), Eng. scientific writer, divine, and topographer, b. probably in Shropshire. He held the livings of Icklesham and Winchelsea in Sussex, St. Margaret Moses, and St. Mildred, Bread Street, and was a prebendary of

Rochester (1707). He was best known as the editor of the *Dictionary of the Arts and Sciences* (1704); and as the compiler of a *Collection of Voyages and Travels* (1705).

Harris, William Torrey (1835-1909), Amer. educationist, b. at N. Killingley, Connecticut. In 1873 he opened the first public school kindergarten in America, and from 1889 to 1906 was state commissioner for education. He founded in 1867 the *Journal of Speculative Philosophy*, and pub. *An Introduction to the Study of Philosophy* (1889) and *Psychologic Foundations of Education* (1898). See J. S. Roberts, *William Torrey Harris: a Critical Study of his Educational and Related Philosophic Views*, 1944.

Harris, par. in the Outer Hebrides, Inverness-shire, Scotland, comprising the S. part of the is. of Lewis, the adjacent is. of Killigray, Pabay, Scarp, and Tarrensay, and the distant is. of St. Kilda. H.-Lewis is separated from the mainland by the Minch, and to the S. is the sound of H., the only navigable channel through the Hebrides. H. is separated from Lewis by a long range of hills, and is nearly cut in two by the lochs of Tarbert. The pop. is engaged in crofting, fishing, and sheep-farming; the wool-weaving connected with the latter is done on handlooms, and the material is the noted H. tweed. Some is. weavers, though still using handlooms, are importing yarn, and their cloth does not qualify for the official stamp—an orb applied only when the tweed is woven by hand in the Outer Hebrides from virgin Scottish wool spun in the is. There are 1600 looms at work in the is. and the annual production is over 4,500,000 yds. Area 123,757 ac. Pop. 296.

Harrisburg: 1. Cap. of Pennsylvania, U.S.A., on the Susquehanna R., 105 m. W.N.W. of Philadelphia. It is named after John Harris, Quaker, who settled here in 1704. Seven railroad bridges cross it. Among the chief buildings in the city are the court-house, gov. buildings, state arsenal, state asylum, opera-house, and seven handsome public monuments. It became the cap. of Pennsylvania in 1812, and was incorporated as a city in 1860. It is also the see of a Rom. Catholic bishop. Coal and iron are extensively worked in the neighbourhood, and it has manufactures of railroad cars, carriages, type-writers, boilers, bricks, cotton and woolen goods, silks, etc. Pop. 83,800. 2. Banking post tn., cap. of Saline co., Illinois, 110 m. S.E. by E. of St. Louis, Missouri, on the Cleveland, Cincinnati, Chicago, and St. Louis railway. It has coal- and iron-mines, flour-mills, and carriage factories. Pop. 11,400.

Harrismith, tn. in Orange Free State, cap. of the H. dist., named after Sir Harry Smith (soldier). Has an altitude of 5250 ft. and is connected by rail with Durban, Natal, 170 m. to the N.W. A prosperous trading centre for a large part of the country lying W. of the Drakensberg Range. Has a large woollen factory. It is a leading health resort of S. Africa, and is one of the best points whence to visit the Kruger National Park, the Mont-aux-Sources, and N. Basutoland. Has golf

links and race-course. Most of the streets are planted with trees. The Dutch church is a five-storey building with spire. H. high school has 700 pupils. In a cave not far distant from the tn. are some well-known bushman paintings. Pop. (1945): white 3250; all races 9200.

Harrison, Benjamin (1740-91), Amer. patriot, b. in Virginia. He was a delegate to Congress, 1774, and one of the signers of the Declaration of Independence, and was appointed governor of Virginia, 1782-85.

Harrison, Benjamin (1833-1901), twenty-third president of the U.S.A., b. at N. Bend, near Cincinnati, Ohio. He was educated at Miami Univ., and pursued the study of law, being called to the Bar in 1853. He took part in the Civil war, serving in the Union army, and was breveted a brigadier-general in 1865. After the war he resumed his legal work, and was reporter of the supreme court of Indiana in 1860-62 and 1864-68. He also took an interest in the campaign which resulted in the election of James Garfield as president, and in 1881 was elected a member of the U.S. Senate. He was nominated for the presidency in 1888 by the Republican party, and elected, and after his term of office America was in a condition of prosperity and on friendly terms with foreign nations. The settlement of the Bering Sea fur-seal question with Great Britain, the negotiation of a Hawaiian annexation treaty, the passing of the McKinley Tariff Bill, the meeting of Pan-Amer. Congress at Washington, were all events of his presidency. He was again nominated in 1892, but failed to secure election. In 1899 he was leading counsel for Venezuela in its boundary dispute with Great Britain, and was the member for the U.S.A. at The Hague Conference the same year. He wrote *This Country of Ours* (1897) and *Views of an Ex-President* (1901).

Harrison, Frederic (1831-1923), Eng. author and philosopher, b. in London. He was educated at King's College School, London, and at Wadham College, Oxford, where he became a fellow and tutor. He was called to the Bar in 1858, and was prof. of Jurisprudence and international law to Inns of Court 1877-1889. He also worked at a codification of the law with Lord Westbury, and was placed upon the Trades Union Commission of 1867-69, becoming secretary to the commission for the digest of the law, 1869-1870. He was president of the Eng. Positivist Committee, 1880-1905, as well as editor of the Positivist *New Calendar of Great Men*; writing much on Comte, of whom he was a follower. He was Rede lecturer, Cambridge, in 1900; Washington lecturer, Chicago, in 1901; Herbert Spencer lecturer, Oxford, in 1905; and later vice-president of the Royal Historical Society, and London Library. His pubs. include *The Meaning of History* (1862); *Order and Progress* (1875); *The Choice of Books* (1886); *Oliver Cromwell* (1888); *Annals of an Old Manor House* (1893, in which he gives an account of his home, near Guildford); *William the Silent* (1897);

The Millenary of King Alfred (1897); *Tennyson, Ruskin, Mill, and others* (1899); *Byzantine History in the Early Middle Ages* (1900); *Life of Ruskin* (1902); *Theophano* (1904, a 'romantic monograph' of the tenth century); *Nicephorus, a Tragedy of New Rome* (1906); *The Creed of a Layman* (1907); *My Alpine Jubilee* (1908); *Autobiographic Memoirs* (1911); *Among My Books* (1912); *The Positive Evolution of Religion* (1912); and *The German Peril* (1915).

Harrison, Jane Ellen (1850-1928), Eng. writer on Gk. art and religion, b. at Cottenham, Yorkshire. Lecturer in classical archaeology, Newnham College, from 1898. Her pubs. include *Myths of the Odyssey in Art and Literature* (1882); *Introductory Studies in Greek Art* (1885); *Mythology and Monuments of Ancient Athens* (with Mrs. A. W. Verrall) (1890); and *Themis: A Study of the Social Origins of Greek Religion* (1912).



JOHN HARRISON

Engraving after a painting by King

Harrison, John (1693-1776), Eng. mechanician and inventor, b. at Foulby, near Pontefract, Yorkshire. In 1715 he invented a clock with wooden wheels and in 1726 his famous 'gridiron pendulum' which maintains its length unaltered in spite of changes of temp. In 1763 he claimed the reward of £20,000 offered by the gov. for a satisfactory method of determining long. when at sea. He invented a chronometer which, by means of the application of a compensation curb to the balance wheel, determined the long. within 18 m. during a voyage to Jamaica. It was not until 1773, after the direct intervention of the king, that H. received the £20,000. He was also the inventor of the full recoil escapement.

Harrison, Mary St. Leger, see MALET LUCAS.

Harrison, Thomas (1606-60), Puritan, signatory to the death-warrant of Charles I., was b. at Newcastle-under-Lyme. In 1642 he enlisted in Essex's bodyguard, and was major in Fleetwood's horse at Marston Moor (1644). He entered the 'new model' with Fleetwood, and was present at Naseby and Langport and at the captures of Winchester and Basing. From 1650 to 1651 he held chief command in England during Cromwell's absence, and after the battle of Worcester (1651) was charged with the pursuit of the fleeing royalists. He assisted in expelling the Long Parliament in 1653, and was a leading spirit in the Barebone's Parliament the same year. He was deprived of his commission in 1653 under the Instrument of Gov., and suffered imprisonment, 1655-56 and 1658-59, for his relations with the Anabaptists. At the Restoration he was executed because he would neither leave the country nor acknowledge the new monarch.

Harrison, William (1534-93), Eng. historian and chronicler, b. in London. He was rector of Radwinter in Essex from 1560 until his death, and also rector of Wimbish in Essex (1571-82), and canon of Windsor from 1586. His amusing *Description of England*, was intended to form part of 'an universal cosmographie,' planned by Reginald Wolfe, which was finally confined to the description and histories of England, Scotland, and Ireland, of which the topographical section was supplied by H., while Holinshed provided the historical. It was finally pub. in 1577 as *The Chronicles of England, Scotland, and Ireland*, and is an invaluable view of the life and customs of Elizabethan England. Dr. Furnivall gives some extracts from H.'s *Chronologie*, as well as the second and third books of the *Description*, in his *Shakespeare's England*, 1877-78.

Harrison, William Henry (1773-1841), ninth president of the U.S.A., b. at Berkeley, Charles City co., Virginia. He entered the army in 1791 and served till 1798, when he was elected governor of the N.W. ter. In 1800 he was created governor of Indiana, but did not enter office until 1801; and while governor he tried to prevent the sale of alcohol to the Indians. Having had sev. fruitless conferences with the Indian chiefs, he advanced against them in 1811, and gained a complete victory at Tippecanoe. From 1811 to 1813 he was actively engaged in the war with England. From 1819 to 1821 he was a member of the Ohio Senate, and of the U.S.A. Senate from 1825 to 1828. In 1841 he was elected president, but only acted for one month, dying of pneumonia. One of his addresses survives in *A Discourse on the Aborigines of the Ohio*. See life by D. B. Goebel, 1926.

Harrison, tn. in New Jersey, U.S.A., in Hudson co., ad. facing Newark on the E., with which it is connected by bridges. Here is located the state Soldiers' Home. It has steel and iron works, and manufs. cutlery, leather, etc. Pop. 14,100.

Harrogate, municipal bor., inland holiday resort, and watering-place in the W. Riding of Yorkshire, England, about 17 m. N. of Leeds. Area 8314 ac. As a

holiday resort it is notable for its fine hotels, extensive parks, and open spaces (353 ac., including the 'Stray' of 200 ac.), as a centre for music and drama, and for the generous provision for every kind of sport and pastime. In recent years H. has also become very popular as a conference tn., as, besides the amenities mentioned above, it has some fine meeting halls, particularly the Royal and Lounge halls, and the Sun Pavilion in the Valley Gardens. As a health resort it is famous for the natural mineral springs (sulphurous, saline, and chalybeate) which are used both for drinking and bathing, in the treatment of rheumatic, skin, heart, and allied complaints. The Royal Baths, where all waters and treatments are available, as well as all the latest methods of physiotherapy, is a superbly equipped modern building, which was further extended in 1939. For in-patients there is the Royal Bath Hospital, which is a centre for research into the cause and cure of rheumatism. Included amongst the ann. events which attract large numbers of visitors are the open tennis tournament (May), the festival of music (July), and the professional golf tournament (July). Queen Ethelburga's school and Harrogate College are schools for girls. The bor. was incorporated in 1881, and the boundaries extended in 1900, and again in 1938. Pop. (1947) 49,300.

Harrow, or **Harrow-on-the-Hill**, urb. dist. in the H. parl. div. of Middlesex, situated about 19 m. N.W. of London. It is on a hill about 350 ft. high, and has a fine old church (St. Mary's), said to have been founded by Lanfranc, archbishop of Canterbury, in William I.'s reign; at any rate traces of Norman work can be seen on the tower, and there are, too, some old monuments and interesting brasses (one of them to John Lyon). But the tn. is chiefly famous for its school, which was founded in 1571 by John Lyon, to whom Queen Elizabeth granted a charter. It was originally intended for the education of poor boys of the par., but the statute drawn up by the founder in 1590 provided also for the admission of 'so many foreigners as that place can conveniently contain,' which provision has led to the present position of the institution, one of the great schools of England. The building was first opened for scholars in 1611, and since then various new buildings have been added, the chief being the chapel, 1875, containing a glass in memory of the Harrovians who d. in the Crimean war (a memorial has also been added to those who fell in the S. African war); the Vaughan Memorial Library, 1863; and the speech-room, 1877, where a brilliant ceremony is held every summer term. The fourth form room, dating from 1611, contains the names, cut in the panels, of famous pupils, such as Byron, Robert Peel, R. B. Sheridan, and Lord Palmerston (Temple). Among celebrated headmasters may be mentioned Thackeray, Sumner, Butler, Longley, Christopher Wordsworth, and Vaughan. The education afforded is a general one, and includes

the study of classics, mathematics (made compulsory in 1837), modern languages (introduced 1851-55), Eng. literature and hist. (begun about 1869), etc. The old div. into Classical and Modern sides has been superseded by a system in which the subjects are taught in forms and divs., but full provision is made for the study of the subjects of both the former sides. Archery, which was encouraged by the founder who instituted a prize of a silver arrow to be shot for annually on Aug. 4, was abolished in 1776, and cricket, football, etc., have taken its place; the cricket match played every year at Lord's between Eton and Harrow dating back to 1818. Since the passing of the Public Schools Act in 1868, the gov. of the school has been in the hands of a council composed of persons chosen by the lord chancellor, the univs. of Oxford, Cambridge, and London, the Royal Society, and the assistant masters. The number of boys averages 650-700. Pop. (1931) 28,400.

Harry, Blind, or Henry the Minstrel (fl. 1470-92), Scottish poet, was the author of a poem on Wm. Wallace. He was blind from birth, and earned his livelihood by reciting poems and historical tales about Wallace to the nobility. He is mentioned by Wm. Dunbar in the *Lament for the Makaris* along with Sandy Trail, so he must have been dead when that poem was written, 1508, and his own work was probably composed about 1450-65, at any rate a MS. dated 1488 is in the Advocates' library, Edinburgh. It is written in the Lothian dialect, and is entirely devoted to a description of Wallace, but the poem may be in part a trans. from John Blair who was Wallace's chaplain and whose life in Lat. prose was written by H. There have been numerous printed eds. of it, and the modern Scottish version by Wm. of Gilbertfield, 1722, was reprinted thirteen times, and became more familiar than the original. Gilbertfield's version is much praised by Burns. See G. Neilson, *Blind Harry's Wallace*, 1910.

Hart, Sir Robert (1835-1911), inspector-general of customs in China, b. at Portadown, co. Armagh, Ireland. He was nominated for the consular service in China in 1854. In 1859 he joined the new Chinese imperial maritime customs service, and became inspector-general in 1863, a post he held nominally till his death, having resigned in 1906. H. was a friend of Gordon's, and was largely responsible for the reconciliation between Li Hung Chang and Gordon in 1864, and to him was due the settlement of China's troubles in Formosa, and on the Tongking frontier with France in 1885. He pub. *These from the Land of Sinim* (1901, a description of China and its people).

Hart, Solomon Alexander (1806-81), Eng. artist b. in Plymouth; spent early years as engraver's apprentice and miniature painter. Made his name as a painter of historical scenes and characters. R.A. 1840. Appointed prof. of painting in the Royal Academy in 1854, and subsequently librarian. Works include 'Henry I. receiving Intelligence of the Death of his Son'; 'Milton Visiting Galileo in

Prison'; 'Wolsey and Buckingham'; and 'Lady Jane Grey in the Tower'.

Hartal, form of political boycott in India, including the closing of all shops, as a sign of national mourning. Gandhi (q.v.) organised a H. in Bombay in 1923 and, later, in other places, by way of protest against what he regarded as Brit. oppression.

Harte, Francis Bret (1839-1902), author, had, as a lad, an adventurous career, during which he served as a schoolmaster, a miner, and a compositor. His leanings, however, were always towards journalism, and at the age of eighteen he obtained an engagement on a San Francisco paper, to which he contributed his early stories. In 1864 he began to write his *Condensed Novels*, and four years later he founded the *Overland Monthly*, in which he printed his best-known short tales. Secretary of the Mint at San Francisco from 1864 until 1870; in 1878 he entered the gov. service again and went as U.S.A. consul to Orefield, two years later being transferred to Glasgow. In 1885 he retired, and spent his remaining years in London. The *Condensed Novels* pub. in book form in 1867 were much appreciated, and still rank as masterpieces of parody, his skit on *Disraeli* being second only to Thackeray's *Codlingsby*. *The Heathen Chinee* (correct title, *Plain Language from Truthful James*, and first pub. in *The Overland Monthly*, in Sept. 1870) won him a high place as a humorous poet, but it is as the author of short sketches of mining life that he became famous and is still best remembered. He threw over the rough Californian life of those days a glamour that fascinated the whole world, and *The Luck of Roaring Camp* (1870); *Masuwa* (1885); *The Outcasts of Poker Flat*; and *Tennessee's Partner*; are but a few of those that evoked high praise. While not disguising the evil in men, he had the gift of showing that even villains had good in them, and this he brought out without outraging nature or being mawkish. His later work was poor, but these stories will long keep his name fresh. His *Guy Heavistone* is a parody of the 'muscular hero' of the novels of G. A. Lawrence. There are biographies by T. E. Peinbenton, 1903 and H. C. Merwin, 1911. See also J. Erskine, 'Bret Harte, in *Leading American Novelists*, 1910; and L. L. Hazard, *The Frontier in American Literature*, 1927.

Hartebeest, Boer name applied throughout S. Africa to a large antelope of the genus *Bubalis*, on account of its fancied resemblance to a stag. It is characterised by its reddish colour, with black markings on the forehead and nose, long horns, which diverge from each other in the form of a V with tips turned backwards at right angles, and long face with a naked muzzle. It stands about 4 ft. at the withers, and is one of the swiftest of the antelope family. This antelope is really the *Bubalis* or *Aelaphus caama*, and is found in S. Africa and as far N. as Mashonaland and Matabeleland, but the name is extended to include all the numerous members of the same genus found throughout Africa and even in Syria. See ANTELOPE.

Hartford: 1. State cap. and seat of H. co., Connecticut, situated on the Connecticut R., 60 m. from Long Is. Sound. It is the head of navigation, and the distributing point for the Connecticut valley, and is important as a centre of wholesale trade; it is also noted for its insurance business, being one of the leading centres in the world. There are various manufs., firearms, including the Gatling guns, at the famous Colt works, electric machinery and vehicles, bicycles, cyclometers, steam-engines and boilers, typewriters, etc. The tn. has also one of the largest printing houses in New England, besides a large number of handsome and notable buildings. The first settlement was made by the Dutch in 1633, and, in 1635 and 1636, Eng. from New Town (now Cambridge, Massachusetts), settled here. The city was chartered in 1784. Pop. (1940) 166,200. 2. Cap. of Blackford co., Indiana, U.S.A., situated about 60 m. N.E. of Indianapolis. The natural gas supply, the oil fields, and the products from the surrounding agric. country, contribute largely to its commercial interests. Pop. 6900.

Hartford Convention, gathering held in 1814 to discuss measures for securing New England interests against the S. and W., especially with regard to the war of 1812. The Federalists opposed the war on scv. grounds, their chief objection being that it was destroying all Amer. commerce in order to punish Great Britain for crippling a part of it. Thus, all through the war they harassed the gov., but by 1814 the destruction of New England industries had become intolerable, and a convention was called. This met at Hartford, and George Cabot, of Massachusetts, was chosen president. Various proposals were made, but before anything definite could be arranged a satisfactory peace was made and all disasters were forgotten in the blaze of the battle of Orleans. But the fact remains that the delegates practically advocated that for which the S. slaveholding states fought years later - the right to secede. Their programme brought them and their party into odium.

Harthau, vll. of Saxony, Germany, 3 m. S. of Chemnitz. Pop. 7100.

Hartington, Lord, see DEVONSHIRE, DUKE OF.

Hartland, vll. of N. Devonshire, England, 13 m. N.W. of Bideford. Close by is H. Point, at the S. end of Barnstaple Bay. There is a lighthouse.

Hartlepool, municipal bor. and port in the S.E. corner of the co. of Durham, England. The tn. stands on a headland (Hertness) nearly surrounded by the sea, and has an excellent harbour and fine docks, the harbour being protected by a breakwater, 1320 ft. long. The prin. trades of the port are coal exporting and timber importing, and the chief industries have been shipbuilding, fishing, and heavy engineering. In recent years a trading estate has been estab., partly in H. and partly in the neighbouring W. H. on a site of some 100 ac., and a number of new light industries have been estab. The tn. possesses excellent facilities for the fishing

industry, and all types of trawlers and other fishing craft are able to enter the harbour, and approach the quay at all states of the tide. There is excellent access to the quay both by road and rail, and good facilities for repair work, coaling, supply of stores, etc. There is an up-to-date ice factory on the quayside. A new lighthouse was built on the Heugh promontory after the First World War on the site of one built in 1847 which had been removed in the war. There are also two other lighthouses at W. Harbour and the old pier head respectively.

The feature of H. is the par. church of St. Hilda, erected about 1185-1215 near the site of religious house founded in the seventh century. There are many traces of an earlier church or churches on its site, and the Norman doorway is undoubtedly earlier than the rest of the church. The exterior is remarkable for its heavy tower and huge flying buttresses. The nave consists of six unequal arches on each side, supported by magnificent columns, and a clerestory runs the length of both chancel and nave, the arcade in the chancel being particularly beautiful and the capitals of the shafts of exquisite design. The chancel was restored in 1927. The de Brus chapel is, from the historic standpoint, the most important part of the church; for here stands the tomb which is believed to hold the remains of the fourth Robert de Brus or his son Wm. The church registers date back to Elizabeth's reign. Other churches include Holy Trinity, which served as a new par. created in the middle of the nineteenth century in consequence of the growth of the tn., and a Rom. Catholic church built in 1850. St. John's Presbyterian Church (1852) was destroyed in the Second World War.

The name 'Hartlepool' is explained on the assumption that it is derived from Teutonic 'hart' or forest (discoveries of large buried oaks have been made), with the addition of 'in-pol,' i.e. 'in' or 'near' 'the pool or sea,' to distinguish it from the still more anct. par. of Hart. According to Bede, an Irish prince, later called St. Bega or Illeu, founded a monastery near the site of the present par. church c. A.D. 640, under the auspices of St. Aidan. At the Conquest large properties at Hart and Hertness passed to Robert de Brus, one of William I.'s followers. Wm. de Brus, lord of Annandale, and son of the fourth Robert de Brus, obtained a grant from King John empowering him to hold a 'market upon Wednesday every week at this manor of Hertipole.' H. received its charter of incorporation from King John in 1200, which made it the only corporate tn. in the co. palatine of Durham to receive its charter direct from the Crown. The right to elect a mayor was granted in 1230, but the record of mayors does not date back beyond 1315. In 1593 Queen Elizabeth granted a new charter, and Queen Victoria granted one in 1841 and another in 1850. In the eighteenth century H. sank to the state of a mere fishing vll., and even the par. church was allowed to fall partly into ruins. A century later, however, the coming of the railway

brought great prosperity to the tn. In the First World War, when Ger. vessels bombarded the coast of Yorkshire and Durham on a misty morning of Dec. 1914 H. suffered great damage. The war memorial in Redheugh Close shows that 351 men of the navy, army, and mercantile marine, and fifty-two men, women, and children were killed in this bombardment. Although essentially an industrial tn., H. has a fine promenade, open-air bathing pool, and facilities for games, etc. With W. H. (q.v.) the bor. forms the parl. constituency of the Hs. Pop. 16,000.

Hartley, David (1705-57), Eng. philosopher, b. near Halifax. He was intended for the Church, but took up medicine, practising as a physician at Newark, Bury St. Edmunds, London, and Bath. He is chiefly remembered by his *Observations on Man* (1749), in which he upheld the theory that the phenomena of the mind, memory, emotions, and reasoning were the direct result of molecular nervous vibrations. In his elaborate treatise he may be said also to have founded a school of thought based upon the theory of association of ideas. Though his system has long been discarded, its main ideas have continued to influence thought and its mitigation. See life by his son, prefixed to the 1801 ed. of his works; also L. Stephen, *History of English Thought in the Eighteenth Century* (3rd ed.), 1902.

Hartley, tn. in S. Rhodesia, S. Africa, on the main route through the Tati hills, N.-eastwards through Bulawayo and Umtshinga. H. Hill has an altitude of 3800 ft., and consists largely of rich iron deposits. Gold-mining operations are carried on in the dist. Pop. (European) 142.

Hartlib, Samuel (c. 1600-c. 1670), Eng. writer on education and an agriculturist the son of a Polish merchant, b. at Elbing in Prussia. He came to England about 1626, and became acquainted with Milton, who dedicated his *Tractate on Education* (1641) to H., and with Sir Win. Petty, of whose *Two Letters* (1647 and 1618) he was the occasion. See H. Dricks, *Biographical Memoir*, 1865; G. H. Turnbull, *Samuel Hartlib*, 1920; and *Hartlib, Dury, and Comenius: Cleanings from Hartlib's Papers*, 1917.

Hartmann, Karl Robert Eduard von (1842-1906), Ger. philosopher, b. in Berlin. He was educated for the army, but was obliged to quit the service in 1865, and turned his attention to philosophy. His first book, *The Philosophy of the Unconscious*, appeared in 1869, and met with great success, owing to its originality as well as its interesting contents. H.'s Unconscious is the Absolute of Ger. metaphysicians, and is a combination of the metaphysics of Hegel, Schopenhauer, and Schelling, his Unconscious playing the role of creator and of providence. H. pub. books on ethical consciousness, the development of the religious consciousness and Ger. aesthetics, as well as criticisms of contemporary philosophies and defences of his own system, among which may be mentioned *Ethical Consciousness* (1879); *The Crisis of Christianity in Modern Theology* (1880); *Judaism in the Present and the*

Future (1885); *Aesthetics* (1886-87); *Lötz's Philosophy* (1888); *The Philosophy of Religion* (2nd ed.) (1888); *The Ghost Theory in Spiritualism* (1891); *The Fundamental Social Questions* (1894); and *Critical Grounds of Transcendental Realism* (1896). He was a pessimist as regards the inevitable misery of existence, thinking that happiness is neither attainable here, now, nor hereafter, but an optimist in that he was a champion of evolutionary progress. See L. Ziegler, *Das Weltbild Hartmanns*, 1910; K. O. Petraschek, *Die Logik die Überzeugungen*, 1926; and D. Brinkmann, *Probleme des Überzeugens*, 1943.

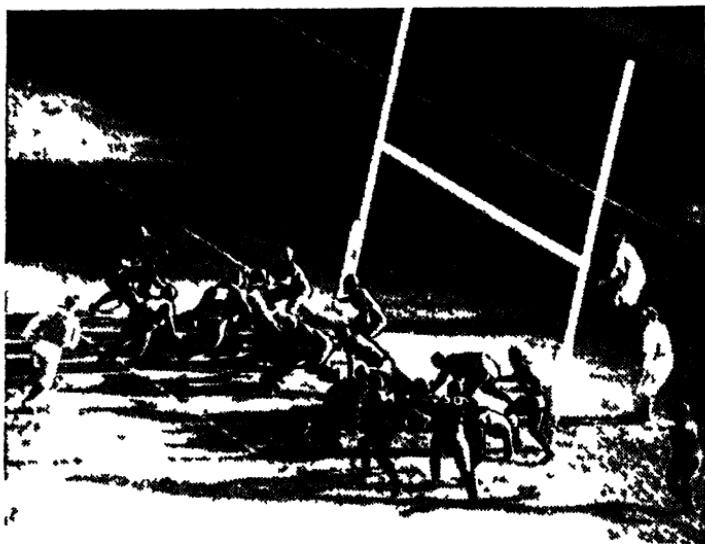
Hartmann von Aue (c. 1170-c. 1210), Ger. poet, b. in Swabia. He took part in a crusade in 1197, and is mentioned by Gottfried von Strassburg about 1210 as being alive, but both the date of his birth and that of his death are uncertain. He pub. four poems: *Erec*, which relates the legend reproduced in Tennyson's 'Geraint and Enid' in *Idylls of the King*; *Iwein*, a better work than the former, and also taken from the Arthurian cycle; *Gregorius*, a narrative poem of the early life of Pope Gregory the Great; and *Der arme Heinrich*, one of the most delightful specimens of medieval Ger. poetry. His work was largely adapted from the Fr., *Erec* and *Iwein* being trans. of epics by Chrétien de Troyes, and *Gregorius*, too, was taken from a Fr. epic; but, in spite of this fact, H. ranks high as a poet of the Middle High Ger. period, and his works exhibit a delicacy of feeling and a beauty of diction rarely found in writers of the time. See H. Drube, *Hartmann und Chrétien*, 1930.

Harty, Sir Herbert Hamilton (1880-1941), Irish composer and conductor, b. at Hillsborough, co. Down. Mainly self-taught. Appointed organist in an Antrim church at the age of twelve. Later, in Dublin, he came under the influence of Signor Esposito at the Royal Irish Academy of Music and, in London, he soon became famous as an accompanist. At the Fers Ceoil or Irish music festival, he obtained many successes in the composers' competitions and soon became recognised as one of the most individual of the younger composers. His wife, Mme Agnes Nicholls, was chiefly instrumental in making his songs popular; his setting of Kent's 'Ode to a Nightingale' was sung by her with great success at the Cardiff Festival, 1907. His works at first showed the influence of Irish folk melodies, notably in his *Irish Symphony* (an early work, revised in 1923), and *With the Wild Geese*, performed in 1910 (inspired by a poem of Emily Lawless dealing with the departure of Irish soldiers into exile after the collapse of the Stuart cause in Ireland); but he became more cosmopolitan and modern in later years. His concerts with the London Symphony Orchestra proved him one of the most brilliant conductors in England, and he afterwards became permanent conductor of the Hallé Orchestra, Manchester, earning a reputation as one of the foremost of European conductors. Knighted 1925. Resigned from the Hallé Orchestra, 1933. Elected F.R.C.M. in 1921. Other works include a violin

concerto in D minor (1909), *The Mystic Trumpeter* for voices and orchestra (1913), an orchestration of Handel's *Water Music*, and *A John Field Suite* (1939).

Hartzenbusch, Juan Eugenio (1806-80). Sp dramatic poet b at Madrid, and educated for the Church. He began dramatic work by translating and recasting existing plays and became famous with his first play produced in 1837. This was *Los Amantes de Ixerla*. His next productions were *Doña Mencía* (1839), *Alfonso el Asto*, (1841), and in 1845 *La Jura en Santa Gadea*. He became director of the National Library at Madrid in 1862, and

Harvard, John (1607-38), Amer clergy man, founder of Harvard Univ. B in England, was entered as a pensioner of Cambridge Univ., 1628, graduated B A, 1631, M A 1635. Very little is known of his life, but he emigrated to America and was made a freeman of the colony of Massachusetts 1637. Allotted a site for his church in Charlestown, in which tn he d on Sept 24 1638. In his last year he was made a member of a committee 'to consider of some things tending toward a body of laws'. Of his fortune of £1800 one half was left for the founding of the famous college which bears his name, but



Topical Press

HARVARD v YALE AMERICAN FOOTBALL

Yale bck being tackled after he had hurled through the crimson line for a gain against Harvard

at the plays of Tirso de Molina. *Caldíron*, etc. See A S Corblére, *Juan Eugenio Hartzenbusch and the French Theatre*, 1927.

Hartz Mountains, see HIRZ

Harun-al-Rashid, see HAROUN AL RASCHID and ABBASID

Haruspices, class of soothsayers of ancient Rome, wh foretold events chiefly by the observation of the entrails of animals. They also interpreted all portents or unusual phenomena of nature and were especially employed to deal with cases not mentioned in the pontifical or Sibylline books, prescrib'g the offering necessary to propitiate the god. They were of Etruscan origin, and were introduced into Rome by Romulus about 750 B C, and abolished by Constantine in A D 337. As a class they ranked below the augurs, being paid, and although the art was of great importance, it never formed part of the state religion.

it is said that part of his bequest was diverted from its original purpose. He also left to the college a library of 300 books, the quality of which point to the taste of a scholar. A monument to his memory was laid in the burial ground of Charlestown by the alumni of the univ., and formally inaugurated on Sept 26, 1828, by the Amer statesman and orator, and one time governor of Massachusetts, Edward Everett.

Harvard University, oldest institution of learning in the U S A, was founded in Cambridge, Massachusetts, by the general court at Boston on Oct 28, 1636. It received its name from John Harvard (q v.), who bequeathed to it £750 and his library. The first building was erected in 1637, and the first graduating class was estab in 1612. There were immense difficulties to be overcome at the time of the foundation of the college, especially those dealing with

religion, but the authorities persevered, and the heroic courage necessary was never found wanting. Between 1642 and 1782 Harvard College conferred only the degrees of bachelor and master of arts, but in 1782-83 three professorships of medicine were estab., the first degree of bachelor of medicine being conferred in 1788 (the school is now removed to Boston). H., by the richness of its endowments, by the wide scope of its schools, colleges, and museums, by its intimate connection with the life and literature of New England, has in many ways filled in the U.S.A. the combined place hold in Eng. life by Oxford and Cambridge. It numbered among its profs. in the first half of the nineteenth century three men who were among the brightest stars in the Amer. literary firmament of the period, H. W. Longfellow, Oliver Wendell Holmes, and James Russell Lowell. Many of the most famous New Englanders, including authors, historians, and statesmen, were graduates from H. Another famous literary graduate from H. is T. S. Eliot. In the fullest sense of the word it became a univ. rather than a mere academic college, adding to its curriculum constantly and keeping abreast of the times. Thus it had a medical school as early as 1782. It added a law school in 1817, and a divinity school in 1819 (the Hollis professorship of divinity was estab. in 1721). When dentistry became an important branch of Amer. practice, it estab., in 1867, a school of dentistry. There followed the Bussey school for agriculture at Jamaica Plain in 1871, the Graduate School of Arts and Sciences in 1872, the Graduate School for Business Administration and the engineering school in 1908. It not only estab. these various additions to the univ., but was quick to recognise that the pupils must have the advantage of great collections which they could study. It thus came about that it estab. its own botanic gardens in 1807; the Asa Gray Herbarium, 1884; the Arnold Arboretum, 1872; the zoological museum, 1859; the Peabody museum of ethnology and archaeology, 1860; the Fogg art museum, 1895; the Semitic museum, 1889; the Germanic museum, 1902. It maintains a big astronomical observatory and its library is the largest univ. library in the U.S.A. Co-education, such as is known in many of the W. states, is unknown at Harvard, but Radcliffe College, estab. in 1879 for women students, has the same high standards of teaching and examinations as Harvard, and the diplomas are issued and signed by Harvard officials. It has over 8000 students and 2000 profs.

Many of its pubs. are world-famous among experts, particularly those dealing with oriental studies. It is not behind-hand in the Amer. zeal for college athletics, the ann. baseball and football contests between Harvard and Yale being among the starred events of the year.

Harvest and its Customs. II. (from the A.-S. *hārfest*, autumn) is the season for the gathering in of the crops, and has always been regarded as a time of rejoicing from time immemorial. The Jews

celebrated the feast of Pentecost as their H. festival, the Romans held feasts in honour of Ceres, and the Druids kept their feast on Nov. 1. Before the Reformation Aug. 1, or Lammas Day, was generally considered the first day of the II. festival in England, and was marked by the presentation of a loaf made of new wheat, in the churches, by every member of the congregation. Afterwards the feast of ingathering, known in Scotland as the 'kern,' was a peculiar secular method of celebrating the close of the II. This still survives in some places, but the modern general H. festival is rapidly superseding it. It is recorded in the *Folk-lore of North England*, 1879, that in the N. part of Northumberland at the close of the H., when the last sheaf of corn is set on end, the 'kern' is celebrated. An image is crowned with wheat-ears and dressed in a white frock and coloured ribbons, and hoisted on to a pole. All the reapers then crowd round their 'kern-baby,' or 'harvest-queen,' and go to the barn where a supper awaits them. In Scotland the last sheaf is called the 'maiden,' and the youngest girl in the II.-field is supposed to have the privilege of cutting it. But in the N.E. of Scotland, it is known as the 'cailleach' (old woman), and is dressed up as such, being placed at the head of the table at the H. feast. Then there is the custom, once prevalent in E. Anglia, known as 'hollering largess.' The reapers form a ring in front of the house, bow their heads very low towards the centre of the circle saying 'Hoo-Hoo-Hoo,' then jerk their heads backward shrieking 'Ah! Ah!' After this the leader of the band cries 'Holla largess!' which is echoed by the company. In Herefordshire a final handful of grain was left uncut, but was tied up and given the name of a 'mare.' The reapers then threw their sickles at it to cut it down, the successful one crying out 'I have her! A mare, a mare, a mare!' A similar practice to that of crying the 'mare' was that of the 'cripple goat' in the Isle of Skye, and in Devonshire the last handful of the standing grain is still called the 'nack,' or 'neck.' The worship of the last sheaf seems to have been the main feature of the festival throughout the world; in Russia it is or was known as the 'bastard,' and a boy is wrapped in it, the woman who binds it being the 'corn-mother.'

Harvest-bug, or Harvest-mite. common name for mites of the family of Trombididae, of the order Acari of the class Arachnida. At one time they were regarded as a distinct species (*Lepitus autumnalis*), but are now known to be the six-legged larval forms of sev. species of the genus *Trombicula*. They are minute, scarlet, or rusty-brown mites, which are found in enormous numbers on gooseberry bushes, grass, and low herbage in the summer and autumn. They are parasitic, and especially liable to attack man, causing intense irritation by lodging in places where the skin is thin, such as behind the knees or between toes. After a certain time they leave their host and drop to the ground when they feed upon minute

insects. The best remedy is to destroy them by applying turpentine, ammonia, or spirits of wine to the affected part. See MITES.

Harvester-spiders, or **Harvest-men**, so called on account of their abundance in the late summer or early autumn, are Arachnids of the order Opiliones, referable to various species of the family Phalangidae. They can easily be distinguished from spiders because they have no waist between the cephalothorax and abdomen, and have extremely long thin legs. They feed upon small insects and spiders, and lay their eggs in autumn, which hatch out in the following spring or early summer. H. especially abound in temperate countries of the N. hemisphere, but are also common in India.

Harvest-fly, species of *Cicada* (q.v.).

Harvest Mouse, see under MOUSE.

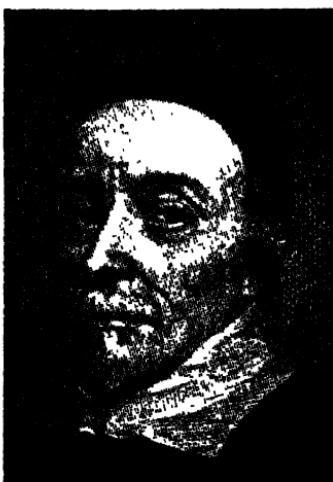
Harvey, Gabriel (c. 1545–1630), Eng. writer, b. at Saffron Walden in Essex. In 1570 he was elected fellow of Pembroke Hall, Cambridge, when he became an intimate friend of Edmund Spenser, for whose Hobbinol in the *Shepheards Calender* he served as model. H. was an excellent scholar and an elegant Lat. writer, but his bitter controversies with Greene and Nashe, the dramatist, who made him the butt of two brilliant satires, *A Quip for an Upstart Courter* (Greene), 1592, and *Hawke with you to Saffron Walden* (Nashe), 1596, brought on him general contempt. After H.'s retort to the latter in *The Trimming of Thomas Nashe* (1597), Archbishop Whitgift forbade all such books of satire (but the attribution of this last-named work to H. is doubtful). See *Works* (editor A. B. Grosart), 1884–85; and I. Disraeli, *Calamities of Authors*, 1840.

Harvey, Sir George (1806–76), Scottish painter. He painted pictures illustrating the hist. and daily life of the Scottish nation, among which is 'Covenanters Preaching.' Also a painter of landscape, his finest being 'Ferragon.'

Harvey, George Brinton McClellan (1864–1928), Amer. publisher and diplomatist, b. at L'eacham, Vermont, U.S.A. Began work as a newspaper reporter. He then went into the electric railway business in the U.S.A. and Cuba, and made a fortune. In 1899 he bought the *North American Review* and ed. it until 1915. He became president of the book-publishing firm of Harper & Bros., and from 1902 to 1913 ed. *Harper's Weekly*. His friends have made the claim for him that he was a sort of Amer. Warwick who made presidents. In 1910 he helped bring about the nomination and election of Woodrow Wilson as governor of New Jersey. He then began an active campaign to bring his name before the nation as a possible president. But in 1916 H. opposed the election of Wilson when he sought to bring the U.S.A. into the League of Nations, starting *Harvey's Weekly*, which indulged in bitter criticism of the president. H. was instrumental in bringing about the nomination of Senator Harding for the presidency by the Republicans in 1920. Harding showed his gratitude by naming H. as ambas. to the Court of St. James's in 1921.

Harvey, Sir John Martin, see MARTIN-HARVEY, SIR JOHN.

Harvey, William (1578–1657), physician and discoverer of the circulation of the blood, b. at Folkestone, Kent. He was educated at Canterbury and Cambridge, and travelled through France and Germany to Padua, the most famous school of physic of that time. In 1607 he was elected a fellow of the College of Physicians, and in 1609 was made assistant physician at St. Bartholomew's Hospital.



WILLIAM HARVEY

In 1615 he was made Lumleian lecturer at the College of Physicians, where he made known his theory of the circulation of the blood, publishing his essay on the subject in 1628. In his essay he shows that the blood coming into the right auricle from the vena cava, and passing thence to the right ventricle, is pumped out to the lungs through the pulmonary artery and comes thence by the pulmonary veins to the left ventricle. It is then pumped out to the body. It is carried out by the arteries and comes back by veins, so performing a complete circulation. H. is famous as being the first to give an exact explanation of this theory. See R. Willis (trans.), *Anatomical Disquisition on the Motion of the Heart and Blood* (1848; Everyman's Library, 1907).

Harvey, banking city of Cook co., Illinois, U.S.A., on the Illinois Central and other railroads, and a suburb of Chicago. Manufs. stoves, machinery, etc. Pop. 17,800.

Harveyised Steel, see under STEEL.

Harwich, municipal bor., seaport, and market tn. in Essex, England, on a small peninsula at the confluence of the Stour and the Orwell, 70 m. N.E. of London. Dovercourt is the residential quarter of

II., and is a favourite seaside resort. There is a large trade in shipbuilding, cement, and fish, and it is one of the chief Eng. ports for continental passenger traffic. It has been a fortified port since the time of James I., and was the scene of a naval engagement between the Dutch and Eng. in 1666. It has been an important trading centre since the fourteenth century. Pop. 14,000.

Harwood, Basil (1859-1949), Brit. organist and organ-music composer, b. in Gloucestershire, and educated at Charterhouse School and Trinity College, Oxford. After a period as organist at St. Barnabas, Pimlico, and at Ely Cathedral, he became organist of Christ Church Cathedral, retiring in 1909. He was also an orchestral and choral conductor, being the first conductor of the Oxford Bach choir. He wrote much Anglican church music, including his popular Service in A flat. Various choral-orchestral works were performed at festival programmes. Among his most notable organ compositions are a Sonata in C sharp, Pean, and Dithyramb, which, together with later works are distinguished for their dignity and for their vigorous and rhapsodical character.

Harwood, Sir Henry Harwood (b. 1888), Brit. sailor. Entered the navy as a midshipman, 1904. Lieutenant, 1908; Commander, 1921; Captain, 1928. Commanded H.M.S. *Warwick* and 9th Destroyer Div., 1929. Imperial Defence College, 1931-32. Appointed to H.M.S. *London*, 1932-34. On staff of Royal Naval College, 1934-36. Commodore commanding S. Amer. Div., and H.M.S. *Erebus*, 1936-39. Rear-admiral commanding Brit. forces in action against the Ger. pocket battleship, *Graf Spee* (q.v.) Dec. 1939. Promoted rear-admiral and knighted. A Lord commissioner of the Admiralty and an assistant chief of naval staff, 1940-42. Commander-in-chief Mediterranean, with the acting rank of admiral, 1942; in similar capacity in the Levant, 1943. Promoted vice-admiral, 1943. Flag-officer in Orkneys and Shetlands, 1944-45. Retired with rank of admiral (medallion unit).

Harwood, tn. in the co. of Lancashire, England, 2 m. N.E. of Bolton. Pop. 2000.

Harzburg, summer resort in the Harz Mts., Germany, at the N. foot of the Brocken in Brunswick. It lies in the shadow of Burgberg (1520 ft.), 28 m. S. of the tn. of Brunswick, and includes the neighbouring hamlets of Neustadt, Bündheim, and Schlewecke. On the Burgberg are the ruins of a castle built in 1065 by the Emperor Henry IV., and the 'Cassone pillar,' erected in 1877 in honour of Bismarck. The tn. is now famous for its brine and carbon springs. Pop. 6000.

Harz Mountains, most northerly mt. system of Germany, extending between the Rs. Weser and Elbo. Their greatest length is 57 m., from S.E. to N.W.; their greatest breadth about 20 m., from N. to S.; and their total area about 784 sq. m. The range consists of an elevated plateau rising steeply on all sides, more especially on the N., and divided into the Upper and

Lower Harz, with a general elevation of from 2000 to 3000 ft.; the Brocken, which separates them, belongs to the former and reaches a height of 3750 ft. The range is heavily wooded, and its wild and melancholy beauty has given rise to numerous legendary tales in Ger. folklore, the chief of which, connected with the Brocken (q.v.), has been immortalised by Goethe in his *Faust*. The H. M. are a favourite summer resort of the Gers., Harzburg, Thale, Bodetal, Alexisbad, Hubersbad, and other places having, in addition to their natural charm, the advantages of mineral springs, pine-needle and other baths, whey curds, etc. The dist. is particularly rich in metals and minerals, silver, lead, iron, copper, sulphur, arsenic, marble, granite, and gypsum all being found. The chief mining centres are St. Andreasberg and Klausthal, the 'Samson' mine, near the former, being one of the deepest shafts (2790 ft.) in Europe. Vitriol is also manufactured, and there is a large timber industry. A rack-railway up the Brocken was opened in 1898, the observatory on the top of the mt. dating from 1895. In the W. front campaign of 1945 the First (Amer.) Army offensive, S. of the H. M., got under way by April 11. On April 14 an armoured div. of the 7th Corps reached Dessau, S. of the confluence of the Elbo and Mulde Rs. In the course of this thrust the H. M., containing some 10,000 Ger. troops, were almost encircled, but attempts to reduce this enemy 'pocket' met with strong resistance. The garrison succeeded for some time, with the aid of the difficult terrain, in holding the allied inroads to a minimum, while striving to keep open a corridor to the E., near Bernburg. The encirclement was nevertheless completed when this corridor was severed on April 18. A desperate attempt by the von Clausewitz Panzer Div. to relieve the garrison by a dash across some 50 m. of allied-held ter. was foiled, and opposition within the 'pocket' soon weakened. The last organised resistance in the Harz finished on April 21. See H. Hoffmann, *Der Harz*, 1899, and *Harz und runa*, 1902; and C. Marlowe, *Harz Mountains*, 1930.

Hasa, El. dist. in the E. of Arabia, stretching for some 360 m. along the shore of the Persian Gulf. In the spring of 1914 H. prov. was taken from the Turks by the Arabs, and since then it has remained an Arabian possession, and has prospered. Its cap., Hufuf (pop. 30,000) is one of the prin. trading centres of Nejd, of which kingdom (before its union with the Hejaz) it was the headquarters. Dates, rice, cotton, and indigo are cultivated, and canals are bred; it also shares in the valuable pearl fishery of Bahrain. Other tns. are Katif, Ujer, the port of El H., and Mubarraz, famous for its hot springs. Most of the pop. consists of nomads, but it is estimated at about 150,000.

Hasbaya, or Hasbeya, tn. in Syria, 22 m. E.S.E. of Sidon. In 1846 a Protestant mission was estab. here, and during the Druso massacre of 1860 the tn. was nearly destroyed, most of the Christians fleeing

to Tyre or Sidon for refuge. Pop. numbers about 5600, 4000 of whom are Druse or Christians.

Hasdeu, Bogdan Petrescu (1836-1907), Rumanian historian and philologist. His *Critical History of the Roumanians* (2 vols., 1875) is valuable, chiefly on account of his broad and original views. Among his other publs. are *Curențe den Bătrâni* (1878-1881); *Etymologicum Magnum Romanicæ*, the chief dictionary of the Rumanian language (1887-93); and *Strati si Substrati* (1893), an account of the origin of the Balkan peoples.

Hasdrubal, name of two Carthaginians: (1) (d. 221 B.C.). The son-in-law of Hannibal Barca, on whose death in 229 he be-

came leader of the Carthaginian forces in Spain. He founded the city of New Carthage, and agreed to the treaty with Rome which forbade him to pass the Iberus (Ebro). He was assassinated by a slave, whose master he had killed. (2) (d. 207 B.C.). The son of Hamilcar Barca, the brother of Hannibal. When Hannibal set out with his troops for Italy (218), H. was left in command in Spain, where he had to contend with the two Scipios. In 207 he marched into Italy with reinforcements for his brother, but was defeated on the Metaurus by the consuls M. Livius Salinator and C. Claudius Nero. He was slain in battle, and his head was thrown into Hannibal's camp.